

# COMPUTERWORLD

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## IBM quietly fortifies embattled VSE

By Paul Gilks  
CW Staff

WHITE PLAINS, N.Y. — IBM has quietly unveiled a series of major enhancements to its VSE/System Package. The announcements constitute what observers agree is the biggest boost IBM has given its beleaguered DOB operating system in several years.

Among the highlights of VSE/SP 3.1.0 are a consistent interactive interface, the extension of virtual support from 16M bytes to 40M bytes, an enhanced librarian and conditional JCL. The updated system also provides support for networked IBM Personal Computers within the DOB/VSE environment.

As part of the release, IBM also unveiled enhancements to VSE/Interactive Comput-

ing and Control Facility, VSE/Power and Advanced Communications Function/Vsam (story on page 8). VSE/SP 3.1.0 will be available in April 1985.

The interactive interface makes VSE/SP base components and some additional sys-

*Next week's In Depth takes a hard look at what VSE/SP 3.1.0 means for users.*

tem services available to all users under a unified command structure that can also be tailored to the individual user, IBM said. The interface is a consistent set of function lists, dialogues, Help facilities and selection and data entry panels. The

features are useful in the areas of system administration, operation, application development and end-user access, a spokesman said.

Installation support has been improved so that the pregenerated system is delivered on two distribution tapes and reportedly can be installed in about two hours. Faster problem diagnosis is possible through fixed system layout and on-line problem determination, IBM said. On-line problem determination aids are provided for IBM CICS users, and Help facilities have been added.

Networking and distributed data processing support was also enhanced. VSE/SP 3.1.0 allows cross-domain login from other systems having ACF/Tsam or ACF/ Sys RDB/VSE page 8

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## Ownership of software package at issue

If jointly installed, does it belong to consulting firm? Or firm's client?

By Jeffrey Bessler  
CW West Coast Bureau

SAN FRANCISCO — A small consulting firm and a huge U.S. bank are locked in a bitter legal battle over which owns a custom software module that the two organizations jointly adapted to the financial institution's existing systems.

Both Tinsman Consultants, Inc. and the giant Bank of America claim to be the exclusive owner of the proprietary software, which the consulting company installed while working under contract for Bank of America.

Gaius Tinsman, the consulting firm's president, said he wrote the On-Line

Mass-Driven System years before he began merging the software into Bank of America's electronic funds transfer network.

Last February, six months after his association with the bank abruptly ended, Tinsman requested a preliminary injunction to force the bank to cease using OLMSD and return the code. The injunction would also order the bank to stop hiring Tinsman's programmers and, thus, inducing them to breach their employment agreements with him.

If the injunction is executed and Tinsman posts the necessary bond, the Bank of America will furnish the consultant with a

copy of all the disputed OLMSD software, except for the system's security programs, according to a bank attorney.

Under the proposed injunction, each side would be permitted to use its respective copy of OLMSD as it sees fit, but would be forbidden to "waste or destroy" the system, the Bank of America lawyer said during an interview.

For the moment, though, the bank retains complete control over both its OLMSD object code and, far more important, the only copy of the system's indispensable source code, according to Tinsman's attorney, Richard Jones.

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Subbing in new players: Honeywell, Inc. retired three older members of its DPS 7 lineup, but brought in three replacements. Page 2. Prime Computer, Inc. enlarged its supermini roster with a mid-range model. Page 4.

If you ignored the April 18 deadline for income tax filing, expect a call from the Internal Revenue Service — a call initiated by a computerized collection system. Page 8.

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Don't give them shelter, federal authorities said as they halted promotion of a tax shelter involving the sale of hardware and software. Page 13.

### FYI

## 'Age machine' evolves from artist's idea

By David Thomas  
CW Staff

NEW YORK — Nancy Burson, a New York artist, had a most unusual idea about 15 years ago. What if, by using a computer-generated art process, a person could see what he would look like in 10, 20 or even 80 years?

Today, after years of effort, what began as an artist's crazy idea has become a marketable reality.

Burson holds the patent on The Method and Apparatus for Producing an Image of a Person's Face at a Different Age, an involved method of simulating the aging process through computer graphics. The age machine, as Burson calls it, produces a composite photograph of the aged person.

Burson worked with scientists at MIT during the late '70s to develop the invention.



Burson, age 4



Artist's update, age 12

"This was one of the first times a computer had interacted with a live image," she said, explaining the university's interest in her project. So far, the method has, among other things, been used to help law enforcement identify what a kidnapping victim might look like years after his disappearance.

Burson hopes someday to use her invention for a "participatory video" application in which a person looking in a viewer could actually see himself aged. "My work deals a lot with the different aspects of perception. And this [aging] is basically how we perceive ourselves," said Burson, whose other artistic endeavors include painting, drawing and video production.

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## NEWS

# Honeywell replaces three DPS 7 models

By Tom Whitel  
On Staff

WALTHAM, Mass. — Honeywell, Inc. has replaced three members of its DPS 7 line of low-end mainframes with E series models that offer roughly the same internal performance as their predecessors, but carry prices tags that are 10% to 21% lower.

Announced last week were the DPS 7/45E, the DPS 7/55E and the DPS 7/65E. The first member of the E series, the entry-level DPS 7/45E, was announced early last summer (CW, July 4).

The latest E series processors are said to incorporate features that make them easier to use in conjunction with Honeywell's older Level 63 minicomputer processors. These features include a mass storage processor that supports the firm's 8004-byte MSU0800/1 and 300M-byte MSU0800/2 disk drives, which previously ran

only on the Level 63 and DPS 7/35E. The mass storage processor expands the E series' mass storage capacity to a maximum of 300 bytes, a spokesman said.

Other features added to the E series line include a tape adapter that supports up to four 8-track, 1,600 b/in. tape units that can operate at 40 or 75 in./sec; a switch to new technology 64K-bit memory chips; and a switch from copper to gold connectors on printed-circuit boards.

The E series processors are compatible with Honeywell's Goss operating system and all peripherals developed for the DPS 7 line, Honeywell said. The company will no longer market non-E models of the DPS 7.

While the spokesman said it is possible for users of DPS 7 systems to upgrade to the E series, he also said that such a move would be necessary only for those users whose applications have to run on the Level 63

## mainframes.

Users of the non-E model DPS 7s will have to pay more than users of the E series models to upgrade. The upgrade charges are basically the difference between the purchase prices of the different models of processors, according to the spokesman. For example, it costs \$21,900 to upgrade from a 7/35E system (with a purchase price of \$82,300) to a 7/45E, which carries a \$107,000 price tag (\$21,000 less than its DPS 7/45 predecessor). A user of a non-E model would pay \$34,900 for a similar upgrade.

The 7/55E is priced at \$155,000, \$45,000 less than the non-E model, and the DPS 7/65E costs \$215,700, \$40,000 less than the DPS 7/65, the spokesman said.

Additional information on the E series models is available from Honeywell, which is headquartered at 200 Smith St., Waltham, Mass. 01154.

# DPS 7 software bundled up

WALTHAM, Mass. — Besides announcing three additions to its E series of DPS 7 processors last week, Honeywell, Inc. also unveiled software that bundles together DPS 7 data base management and transaction processing products and cuts prices on some manufacturing-oriented software for the DPS 7 line.

The Data Management 7 (DM 7) package is a bundled version of several Honeywell program products: Integrated Data Store/II, a Cobol-compiled data base management system; Data Base Administrator AIDE; the Transaction Driven System, a transaction processing package; the Form Management Utility; and the DM 7 Query Processor.

DM 7, which Honeywell said cuts 20% less than the total of all five programs if purchased separately, comes in two versions. DM 7 is for users of Honeywell's Goss operating system and costs \$600. DM 7-ES, for the DPS 7/55E and 45E processors, delivers the same functions as DM 7, but uses the transaction processing capabilities provided by Honeywell's Goss Entry System; it costs \$400.

Honeywell announced price cuts up to 40% on modules of its Honeywell Manufacturing System (HMS 7) software for the DPS 7. HMS 7 provides integrated management control of inventory and production operations.

Initial module license fees are \$8,400 for Inventory Record Management; \$16,900 for Manufacturing Data Control; \$16,900 for Material Requirements Planning; \$16,900 for Master Production Scheduling; \$8,400 for Statistical Forecasting; and \$16,900 for Capacity Requirements Planning. Monthly lease terms are also available, the firm said at 200 Smith St., Waltham, Mass. 01154.

# ATMs declared branch banks by federal judge

By James Connolly  
On Staff

ROCHESTER, N.Y. — A national bank need not own or rent an automated teller machine for that ATM to be considered a branch bank and therefore subject to state and interstate banking laws, a federal court judge ruled here recently.

Any ATM used by a bank to accept deposits or dispense cash should be considered a branch bank, said U.S. District Judge Michael A. Teleca.

Teleca's ruling, which went one step beyond the U.S. Comptroller of the Currency's opinion that an ATM is a branch if a bank owns or rents it, came in a dispute between the \$100 million Canandaigua National Bank and Trust of Canandaigua, N.Y., and Wegmans Food Markets, Inc. and Marine Midland Bank, N.A.

Canandaigua National Bank and the Independent Bankers Association of New York State, Inc. last year sued

Marine Midland and Wegmans, charging that an ATM at a Wegmans supermarket in Canandaigua violated the 1957 McFadden Act, which regulates banks, and New York's home office protection law, which bars outside banks from opening branches in small cities that are headquarters for banks.

The ATM at issue was owned by Wegmans. However, the cash and money office protection law, which is enforced by Buffalo, N.Y.-based Marine Midland, whose customers could use bank cards to deposit and withdraw funds. The ATM was linked to the Harrower network, in which Marine Midland is a participant.

Teleca, noting that the customers' probable impression was that they were dealing with a bank rather than a store despite Wegmans' ownership of the machine, barred Marine Midland from using the ATM. Teleca also denied Canandaigua National's

claim that Wegmans was illegally engaged in banking.

George W. Hamlin IV, president of both the Canandaigua bank and the Independent Bankers Association, said the barring order has the effect of keeping other nationally and state chartered banks from using the ATM at Wegmans, where his bank has one of its six branches. He said only credit unions and federal savings and loan institutions, which are exempt from the McFadden Act, may use the Wegmans ATM.

Marine Midland, which has until May 15 to decide whether to appeal Teleca's ruling, had contended the unfair competition argument by charging that the local bank held an unfair advantage. But Teleca, noting that it is Congress' job to address the competition argument and to update the over 50-year-old McFadden Act, said the law doesn't insure "perfect equality" between banks.

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## NEWS

# 'Forget' to pay your taxes last week? Expect a call

By James Connolly  
CW Staff

Tax Day 1984 passed with the usual sigh as the American taxpayer dropped another year's worth of W-2 and 1040 forms and assorted schedules into the mail slot by the 11:59 p.m. deadline April 16.

But while the last-minute rush was the same as usual, and the tendency for some Americans to cheat Uncle Sam may have been the usual state of affairs, at least one thing has changed since Tax Day 1983. The Internal Revenue Service has added computers to the tax collection force that battles those cheaters. In particular, in the past year the IRS has added automated collection systems to 12 of its 21 telephone collection sites. The GC Services Corp. Automated Collection System (ACS), including software and IBM 4341 mainframes, helps collectors initiate dunning letters and telephone calls to delinquent taxpayers. The system integrates data bases with an automatic call distributor.

Taxpayers — or non-taxpayers, as the case may be — who disregard the first four collection notices sent by IRS regional offices will find their accounts shifted to the automated collection sites spread throughout the country. The system became operational in Kansas City, Mo., and Memphis last year, and by summer should cover the country, with 2,000 operators manning IBM 3101 terminals.

The IRS hopes it can use the system to collect the \$27 billion it is owed in back taxes. "Pilot programs in Kansas City and Memphis last year showed that the automated collection systems closed 50% more delinquent accounts than the old system. At the same time, ACS already has reduced the cost of closing each case to \$29

from \$46, and the program is still new," said William I. Davis, general manager of the Houston-based GC Services' Systems Division.

The collection system is being established under a six-year, \$107 million contract to GC Services, with IBM, Arthur Andersen & Co. and Rockwell International Corp. acting as subcontractors for hardware and software, according to IRS officials.

It will take several months before most 1983 tax year accounts are referred by regional offices for automated collection. But when they are, the system will help collectors contact individuals and businesses according to a complex formula that

ranks accounts by factors such as the amount owed and the age of the account.

According to the IRS, the system updates accounts weekly. When an operator sits down at his terminal, he presses a Next Case function key that calls to the screen data such as a taxpayer's name, address, Social Security number and tax liability. The display also tells the collector what previous collection steps have been taken and what the outcome of those steps has been.

If the system indicates that a dunning letter, levy against wages or lien may be due, the operator uses the system to notify the IRS regional of-

fice. However, if a telephone call is in order, the operator presses the Dial function button, which tells the system to call the taxpayer using the least expensive routing for the call. If the line is busy, the account is scheduled for a later call.

Equipped with headsets, operators can discuss the case with the taxpayer and use the terminal keyboard to update the on-screen data with information such as a promise to pay. Scheduling of calls considers time zone differences and a person's working hours, if known, according to IRS officials. The system is designed to prevent calls to taxpayers before 8 a.m. and after 8 p.m.

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## AT&T profits take a plunge

MILWAUKEE — In its first financial quarter since the divestiture of its local operating companies, AT&T last week reported it realized a profit of only \$226.9 million and said it does not expect to meet its 1984 profit goal.

Three of the seven regional holding companies each realized larger profits than AT&T. Bell South reported profits of \$270.4 million, or \$2.80 per share; American Information Technology reported profits of \$267.6 million, or \$2.66 per share; and Bell Atlantic reported profits of \$236.4 million, or \$2.44 per share.

AT&T's per-share profit of 20 cents was only 9.9% of the \$2.02 per-share earnings that AT&T previously predicted for the year. AT&T Chairman Charles L. Brown told the annual shareholders meeting held here last week that the estimate will probably not be reached.

AT&T had revenues of \$9.04 billion in the first quarter. Because of the divestiture, comparing the first quarter of 1983 were not available. Brown predicted "a rough couple of years" for the company, but said he expects better profits for the remainder of this year.

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## NEWS

# Schools nix DOD proposal to censor research reports

By Richard Warner  
CW Staff

CAMBRIDGE, Mass. — Harvard University last week became the fourth major university to tell the U.S. Department of Defense that it will not accept DOD funding for research projects if DOD wants to censor the reports which result.

Harvard's statement was issued in response to a Pentagon proposal, made two months ago, that research reports for projects it funds should be submitted to its censor at least 90 days prior to publication.

The proposal would restrict public access to reports which contain any material found to be "sensitive" to the national defense, but did not de-

fine that term.

The presidents of three other major universities, all with millions of dollars in DOD research contracts, reportedly sent a letter to DOD last month that protested the censorship proposal and said their schools — Stanford University, the California Institute of Technology (Caltech) and MIT — would refuse those contracts affected by the proposal if it is adopted.

Harvard joined their ranks last week saying, in the words of its general counsel and vice-president, Daniel Steiner, "We will not agree to any restrictions, by the Defense Department or anyone else, in the right to publish research results."

Steiner's remarks appeared in the Harvard campus newspaper, which also said the university received \$4 million in Pentagon research funding last year.

A Pentagon spokeswoman responded to the letter from the presidents of Stanford, Caltech and MIT by saying, "We welcome comment from all parties." She noted that the proposal is still only under consideration.

She also claimed the proposal would not censor any research reports, but simply restrict access to the reports to certain people or groups, such as certain defense contractors or members of DOD.

Spokesmen at Stanford, Caltech

and MIT were not able to say how much of their schools' DOD research was in computer-related areas, but the chairman of MIT's department of computer science, Dr. Harry Lewis, said his department gets as much as \$250,000 annually in Pentagon research funding.

MIT last year received roughly \$30 million in research funding — out of its research budget of \$219 million — from the Pentagon, according to the institute's assistant to the president, Walter Milne, who added that opposition to academic censorship has "been our policy for a long time." Stanford received \$28 million of its \$187 million research budget from Pentagon funding.

## House panel recommends killing Postal Service's Intelpost

WASHINGTON, D.C. — Intelpost, the U.S. Postal Service's international electronic mail service, has realized only \$60,000 in revenues after three years of operation and should be terminated, the U.S. House of Representatives' Committee on Government Operations has recommended.

The service, a cooperative venture with foreign telecommunications authorities, has cost the Postal Service more than \$6 million to develop and operate since 1978. Customer use of the service began in 1982.

While a market for Intelpost may

exist, the Postal Service has not been able to manage it successfully in a competitive environment, a report issued by the House committee said. It suggested the Postal Service hire outside management consultants to recommend new directions for the service.

Intelpost service centers are located here in Washington and in New York, Boston, Chicago and San Francisco.

Customers transport Intelpost messages to the centers, where a scanner reads the document and then

sends it for transmission. The message is printed out and sent through the regular postal mail at the receiving end.

Canada and countries in Europe, the Far East and South America are connected to the system. Intelpost's cost per page is currently \$5. While volume has been growing slowly, it has not met the Postal Service's projections.

Total revenues for the three years of operation totaled \$58,080. Postmaster General William Bolger said the Postal Service board of governors

in February that the service considers Intelpost a "research and development project, and we didn't expect it to meet our costs."

The House report accuses Bolger of misleading the House committee in asserting that Intelpost would not be supported through cross-subsidies from other regular mail revenues. The report also accused the board of governors for not taking a firmer oversight role in the service and for not following recommendations that the price per page initially be set at \$2.

## OLMDS from page 1

The reasons for Bank of America's insistence on keeping at least a copy of OLMDS' source and object code are myriad.

First, the bank warned of "catastrophic" and "devastating" injuries both to itself and to its customers if it were stripped of the disputed software entirely. After years of routine use within the Bank of America, OLMDS has become so thoroughly assimilated into the bank's existing EFT programs that the system has ceased to exist as a discrete entity, according to affidavits filed in Superior Court.

Another reason for the bank's re-

luctance to part with its OLMDS software is that the institution reportedly considers Timmahan's ownership claim invalid and challenges the consultant's account of the system's origin.

If, indeed, the software exists at all, the court documents said, the system came into being only long after the consultant entered into his contractual relationship with the bank. Under a perpetual licensing agreement that Timmahan signed in 1981, any software written during his affiliation with the Bank of America automatically becomes the property of the client, the bank contended in its filings.

Timmahan, however, challenged

the bank's interpretation of the perpetual licensing agreement, rejected the bank's claims of ownership and insisted on exclusive possession of the OLMDS source code. OLMDS forms the cornerstone of the consultant's livelihood, and if the bank continues to deny him access to the source code, his Orinda, Calif.-based company will be unable to attract new clients and will go bust, Jones said.

Timmahan also objected to the Bank of America's steadfast refusal to surrender the security portion of the OLMDS software. In the absence of its proprietary, crucial security programs, the disputed system would be rendered "inoperable," the consul-

tant said in his court papers.

Timmahan's demands for access to the OLMDS source code have acquired an increased urgency during recent weeks with the revelation that the financial institution is apparently working feverishly to convert the system to run on an Amdeh Corp. 470V/6 mainframe. In the past, the disputed software and the bank's EFT network programs have resided in an IBM System/3, Timmahan said.

If the source code remains in the bank's possession and the conversion continues unimpeded, OLMDS will eventually be revised so extensively that it might become virtually impossible for the consultant to identify it as his own, Jones added.

## Consultant's wrangle with bank started last September

The roots of Golub Timmahan's legal wrangle with the Bank of America stretch back to 1978, when the consultant won a contract to modernize the bank's domestic and international electronic funds transfer (EFT) system, known as Remittance Account Procedures/Outgoing Cable Interface (RAP/OCI).

In essence, the contractor's assignment was to transform RAP/OCI from a batch to an interactive system and, thus, substantially improve its performance.

Crucial to Timmahan's reprogramming project was the On-Line Menu-Driven System (OLMDS), a collection of proprietary programs that drive and enhance the functionality of in-

teractive systems, the consultant said. The software package had reportedly found its way into at least two other major user sites before the independent contractor ever entered into his working relationship with the Bank of America.

Mutually satisfactory

For roughly seven years, Timmahan's association with the bank apparently proved mutually satisfactory.

But last September, the consultant was suddenly barred from his client's premises and denied access to the OLMDS source code after the bank allegedly uncovered evidence linking him to three unauthorized

wire transfers totaling \$411,000.

Through his attorney, Timmahan denied any involvement in the illegal transactions and has responded to the allegations with a lawsuit accusing the bank of slander. Although the accusations were referred to the Federal Bureau of Investigation last summer, no criminal charges have been filed against the consultant in connection with the case, according to a source close to the dispute.

In February, the two sides met in court and negotiated an agreement to allow the contractor to reenter the bank's data center and scrutinize three disk packs in which the disputed OLMDS code reportedly resides.

But the BASF packs he was later given to inspect were clearly different from the IBM products he originally brought into the bank, Timmahan said.

The Bank of America, however, claims to have searched its buildings extensively and denies having uncovered even the slightest trace of the three IBM disk packs.

The two sides also disagree sharply over where the OLMDS software is physically located. Timmahan insists the code is scattered among various sites within the bank's corporate headquarters.

But the bank insists the system is confined exclusively to the three BASF disk packs.

## NEWS

## DOD now wants export control over software, too

### Cites 'dual nature' of off-the-shelf packages for micros, superminis and mainframes

By Bryan Whitless  
CI Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Defense wants to add commercially available software with potential military applications to the list of high-tech exports it was recently empowered to review [CW, April 2].

DOD claims that the proliferating use of microcomputers and superminicomputers in key military roles here and abroad requires that export review and technology transfer controls be extended to commercially available software for such systems, as well as to the systems themselves.

The reason, DOD explained last week, is the "dual nature" of off-the-shelf software products for microcomputers, superminicomputers and mainframes, which can be modified for military applications by Eastern bloc countries.

DOD did not specify by name which commercial software products it seeks to control.

#### Before the Senate

Two weeks ago, top DOD officials appeared before a Senate subcommittee to show how certain systems, such as Apple Computer, Inc.'s Apple II+ and the Zilog-byte Grid Systems Corp. portable computer, are an integral part of U.S. and NATO battlefield management [CW, April 16].

DOD itself modifies commercially available off-the-shelf software for military use, including nuclear targeting plans in Europe, command and control procedures and strategic decision making.

"The commercial software is vital to solving a lot of our problems, but we will still need to reconfigure that software to be sensitive to military problems, and there's where we have to build in quite a bit of protection of that software," said Dr. Stephen Bryen, deputy assistant secretary of defense for International Economic, Trade and Security Policy.

#### Lock on software

"We would love to have a lock on the software. It is partially commercial, but with a Defense add-on, we find that the layman is no longer a layman, and our adversaries would be able to figure it out if it is readily available," he said.

Bryen asserted that the Soviet Union has 100,000 translators working on software manuals and is frequently resorting to stealing software if necessary.

"They are quite sophisticated and know exactly what they want," he said.

A recent seizure by Swedish and German authorities of a Digital Equipment Corp. shipment [CW, Nov. 21] turned out to contain a software application that the company had not yet released to the public, he commented.

Bryen observed that the Defense Department is particularly sensitive about the VAX-11/780 line, which is currently under full export review and control by DOD, since DOD has made it the de facto 32-bit standard system for all of its military applications.

A recent advertisement in the *Financial Times* of London sought DDC

programmers to write software for the Soviet Union, according to a Bryen aide, and prompted Bryen to comment, "This is not a joke."

"There is very little we do that doesn't depend on the state-of-the-art computer," he said.

"Without it, we couldn't run our supply lines, we couldn't run strategic bombing attacks, we couldn't run our strategic missiles or coordinate our submarines [or] our communications. An endless array of our defense depends on our computing capability," Bryen said.

"If the other side reaches our com-

puting ability, the bottom line is that we lose our edge," Bryen commented.

The Reagan administration, led by the Defense Department, is currently in the midst of intense negotiations with its European allies to add the military-applicable software to a list of restricted exports to the Eastern bloc countries and the Soviet Union, Bryen said.

The main disagreements with NATO allies over control of software exports concern the strategic utility or potential military applications of a particular product.

"We get into debates about what

kind of software has the most leverage in defense," Bryen said.

"It is a very narrow issue, technical and operational. Part of the problem in export control is determining what defense leverage," he said.

Bryen said that the agreement within the Coordinating Committee for Multilateral Export Controls (Cocom) on the software issue is "pretty close."

Cocom is the principal forum where consensus is reached among the Western allies on what specific products should be restricted for export.



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## NEWS

# Users, vendors say VSE 2.1.0 means DOS here to stay

By Paul  
Civett

IBM's announcement of a new version of its VSE/System Package (VSP) (story on page 1) should soothe any remaining doubts that the company is preparing to phase out its DOS operating system in favor of VM or MVS, according to users and vendors interviewed last week.

Baker, VSE/SP 2.1.0 is an IBM move to define market segments further for the three major operating systems. "Clearly they're marking out some territories," said Mark Combs, vice-president of development at Computer Associates International, Inc. in Jericho, N.Y. "DOS isn't going to compete with VMS. It's going to be a viable alternative for medium- to small-size locations or for distributed processing."

The VSE enhancements contain several features not found in MVS, indicating that IBM is not pushing DOS users to migrate upward immediately. However, the IBM programming announcement also flatly stated that "VSE customers experiencing high growth rates should plan to migrate to MVS" and implied that 31-bit addressing would not be extended to VSE.

Users generally applauded the enhancements. "It's the largest VSE announcement I can remember in terms of capabilities," said Peter Clark, systems programming and data base/data communications administrator at Otis Mills, Inc. of Chittanooga, Tenn.

Added Computer Associates' Combs, "It's head and shoulders above anything previously available for DOS in terms of ease of use and installability."

Clark said the VSE extension to 40M bytes of virtual addressability will ease the on-line burden that has caused him recently to spread his IBM's CICS over multiple machines.

"It allows me to regroup some of my on-line facilities that I had split up in the past because of virtual storage constraints," he said. "It can continue to enhance my current applications, add new ones and migrate back some of the applications I had moved off to the other machines."

Clark also lauded enhancements to the VSE librarian that he said reduce "significantly less chance of a library integrity problem." Space reclamation features and an increase in block size from 160 bytes to 1K byte will also improve library efficiency,

according to Clark.

Virtual addressability improvements will help keep many users within the VSE fold who might otherwise have considered migration to MVS, according to Neal Ater, vice-president of product development at Goal Systems International, Inc., a vendor of IBM-compatible systems software based in Columbus, Ohio. "Before, as soon as people ran out of 16M bytes on 'VSE, they had to jump to MVS/SP, then later to XA," Ater said. "Now they can stick with VSE until they need to go to XA."

However, one user was lukewarm about the virtual address enhancements. "I don't think it addresses the real needs," said Bob Reitz, manager of technical services at Carpenter Technology Corp. in Reading, Pa. "There is no intent at all to extend beyond 16M bytes of real [addressability]. It's still a temporary fix for any shop that's going to see a growth pattern over the next few years."

Reitz noted that VSE/SP 2.1.0 fails to address some other problems of large VSE shops. "File sharing is not something that VSE supports with any great amount of integrity," he said. "There have been no architectural changes to the performance

function of VSE itself as far as alternate path DAD [direct-access storage device]. You're still limited to doing an I/O the way you're doing an I/O right now. And when you get into one of a large system or multiple systems sharing DAD, the I/O subsystem can become the biggest part of the system."

Combs called the new interactive interface the most important enhancement of the new release. "This will give IBM, and users and software companies the ability to put applications into a common, easily manageable form," he said. "IBM is opening the door for people to extend the DOS environment and make it easily more user-friendly. IBM has finally come out with a globally accepted standard."

Perhaps most importantly, observers agreed, IBM has stated that DOS/VSE is here to stay. "It puts to end forever the belief that DOS is dead or VSE is going away," Clark said. "IBM is not going to spend this kind of time and money on a product it doesn't plan to continue."

Added Goal Systems' Ater, "This indicates to us that IBM is really committed to VSE as one of its 'strategic operating systems.'"

## DOS/VSE from page 1

### Vitem Entry.

The networking facilities of VSE/Power Version 2 support the transfer of jobs and job output. A network definition skeleton can be used to create network resource definitions and transport them from host to nodes. New diagrams simplify the configuration of local System Network Architecture (SNA) and non-SNA IBM 3270s, the spokesman said.

Support for connection of Personal Computers and IBM 3270 Personal Computers is provided with IBM 3270/3279 emulation attached to an IBM 4331, 4331 and 4361 processor. Data transfer from the micro to the host and storage in a predefined file is supported along with downloading from the host to the micro, movement

of host-created data to the host, transfer file for download and access to host applications from the Personal Computer. File transfer is always initiated from the Personal Computer, IBM said.

VM/VSE support is added with the VM/VSE Console Communications Facility shipped as a component of VSE/SP 2.1.0. A number of other enhancements were also announced to ease the process of using VSE under VM.

A major enhancement to VSE/Advanced Functions, which is part of the VSE/SP 2.1.0 package, is expansion of virtual address space from 16M bytes to 40M bytes. VSE supports up to three virtual address spaces, each of which can be up to 16M bytes, IBM said. In addition, VSE libraries have been introduced that

provide a single, logical library structure with a common data format for source books, relocatable modules, phrases, procedures and user-defined library types.

Direct-access storage device (DASD) space is utilized more efficiently through a larger blocking factor and the reuse of freed space, IBM said. Automatic reclamation of freed space is used to eliminate the need for library reorganization. An improved user interface is included with equivalent library functions for core key data and fixed-block architecture DASD and extended library access control. A 1K-byte block is used for the new library.

Conditional JCL statements and parameterized procedures have been added to ease handling and maintenance of job streams.

The process of determining I/O configurations has been partially automated, and the DAD sharing concept of VSE has been generalized to support up to 31 CPUs participating. Tape I/O modules have been eliminated, IBM claimed.

A number of enhancements have been provided to improve VSE availability, including improved handling of certain changes and machine checks. Serviceability and installability upgrades were also unveiled.

A full-function VSE/SP 2.1.0 system licenses for \$48,500 for a basic license and \$45,500 under the Distributed System License Option. Also available are monthly charges of \$2,925 and \$1,825, respectively.

IBM's National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

## VSE/ICCF, Power updated

WHITE PLAINS, N.Y. — As part of its announcement of VSE/System Package (VSE/SP) 2.1.0, IBM also added features to VSE/Interactive Computing Control Facility (VSE/ICCF) and VSE/Power.

VSE/ICCF 2.1.0 features include adaptation to VSE/Advanced Function 2.1.0, VSE librarian and VSE/Access Control; queuing/recovery without CICS/VS/VS; shadowing/disconnect capability from a VSE/ICCF terminal or user via the VSE operator console; improved interface to VSE/Power; improved VM/VSE handshaking; conditional job execution in an interactive partition; data retrieval from a VSE/Power reader queue; transparent access to VSE library; improved batch processing; help facilities; concurrent usage of VSE/ICCF Power consoles; improved command handling; and elimination of terminal

wait if no interactive partition is available.

VSE/Power 2.2.0 enhancements include shared spooling; virtual addressability extension; support to cross partition support; source I/O facility inclusion support of the VSE/ICCF library; support of job control return codes; extended VM linkage support; remote job entry improvements; and second-level addressability.

The modules are available individually or as part of the full-function VSE/SP package. VSE/ICCF costs \$5,500 for a basic license or \$5,350 for a Distributed System License Option (DSLO). VSE/Power is available for an initial charge of \$485 (basic) or \$420 (DSLO) and a monthly license charge of \$165 (basic) or \$140 (DSLO).

IBM's National Accounts Division is at 1133 Westchester Ave., White Plains, N.Y. 10604.

## University of Texas plans 32 DP-related faculty slots

AUSTIN, Texas — The University of Texas announced last week that it will establish 32 new professorships in the fields of computer studies, microelectronics, computer-aided design and other engineering and science areas.

Each faculty position will be endowed with \$1 million, most pledged in large part by an anonymous donor and five Texas foundations and backed by the university itself.

University President Dr. Peter T. Fawn said eight fields of study — chemistry, physics, mathematics, molecular biology, computer engineering, computer-aided design and manufacturing and materials engineering — will each have four new professorships.

Emphasis will be placed on filling the new professorships with research-oriented individuals, accord-

ing to Fawn.

The city of Austin is also the headquarters of the Microelectronics and Computer Technology Corp. (MCC), a research venture company backed by a number of leading U.S. high-tech firms.

Those firms include: Control Data Corp.; Digital Equipment Corp.; Harris Corp.; Advanced Micro Devices, Inc.; NCR Corp.; Motorola, Inc.; Sperry Corp.; National Semiconductor Corp.; and Honeywell, Inc. MCC is headed by Adm. Bobby Inman (USN Ret.), former deputy director of the Central Intelligence Agency.

MCC, which is building a research facility on the campus, is still seeking additional high-tech corporations to join its venture program, which is tailored toward the development of a fifth-generation computer and related studies.

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In summary, IDMS/R was designed to satisfy the requirements of the IBM 4300 user who wants to develop both production and end user applications faster and easier.

For further information, attend a Cullinet Seminar. Mail the attached coupon or call Cullinet at 1-800-225-9930 (in Massachusetts 617-329-7700).

\*Frank L. Chisholm is Cullinet's Executive Vice President. Frank has worked closely with Cullinet users and prospective users for more than six years. As a key member of Cullinet's management team, Frank has contributed heavily to Cullinet's database product development strategy.

## IDMS/R Seminar Cities and Dates

City & State	Date	City & State	Date	City & State	Date	City & State	Date
Albany, NY	June 12	Dallas, TX	May 16	Indianapolis, IN	June 14	Baltimore, MD	June 6
Anchorage, AK	May 22	Denver, CO	June 13	Los Angeles, CA	June 7	Birmingham, AL	May 16
Atlanta, GA	May 16	Des Moines, IA	May 18	Memphis, TN	May 8	Boston, MA	May 17
Baltimore, MD	May 17	Detroit, MI	May 19	Minneapolis, MN	May 9	Boulder, CO	May 18
Birmingham, AL	June 6	Fort Worth, TX	June 7	New York, NY	May 10	Butte, MT	May 16
Boston, MA	May 17	Grand Rapids, MI	June 12	New York City, NY	May 11	Cambridge, MA	May 17
Boulder, CO	May 18	Greenville, SC	June 13	New York State, NY	June 12	Chapel Hill, NC	May 17
Bridgeport, CT	May 22	Harrisburg, PA	May 14	North Carolina, NC	June 13	Chattanooga, TN	May 17
Calgary, AB	May 22	Houston, TX	May 15	Orlando, FL	June 14	Chicago, IL	May 17
Charlotte, NC	May 16	Indianapolis, IN	May 16	Ottawa, ON	June 15	Cincinnati, OH	May 17
Chattanooga, TN	May 17	Kansas City, MO	May 19	Philadelphia, PA	June 16	Cleveland, OH	May 17
Chicago, IL	June 12	Lancaster, PA	June 7	Pittsburgh, PA	June 17	Columbus, OH	May 17
Chicopee, MA	May 14	Louisville, KY	May 18	Portland, ME	June 18	Dayton, OH	May 17
Cincinnati, OH	May 16	Lynchburg, VA	May 17	Portland, OR	June 19	Denver, CO	May 17
Cleveland, OH	May 16	Memphis, TN	May 17	San Diego, CA	June 19	Des Moines, IA	May 17
Columbia Springs, CO	May 16			Seattle, WA	June 20	Detroit, MI	May 17

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## NEWS

## Public-access telephone/terminal put on display



ON AT VIDEOTEX '84

By Phil Wittek  
Clt Washington Bureau

**CHICAGO**—A public telephone equipped with a keyboard and a screen was among the products shown here last week at Videotex '84. The terminal is now being tested by two-divided Bell operating company, and its manufacturer, Qwest Corp., is discussing similar arrangements with most of the other divided Bell operating companies.

The Videotex Public Access Telephone Terminal (Vpatt) has been installed at Boston's Logan International Airport by New England Tele-

phone Co. (see story below) and at Chicago's O'Hare International Airport by Illinois Bell. According to David W. Tibbets, who is in charge of the New England Telephone trial, users who dial a local or 800 number can access any of several public data services at their keyboard. They can then read the retrieved information on the terminal's 24-line by 80-char. monochrome screen, he added.

Users also can access private data bases. A traveling salesman, for example, might obtain inventory information or price quotes stored in a home office computer system. Tibbets, who said additional installations of Vpatt are likely this year at Logan as well as at some Boston ho-

tels, noted that one user recently employed the terminal to make some changes in a stored computer program.

In addition to the monitor screen and keyboard, the terminal has a built-in credit card reader and a standard phone handset. Vpatt can serve as conventional telephones as well as data terminals; in either case, the credit card reader enables the phone call to be charged.

The reader also enables data base service charges to be billed to the user's credit card, a Qwest spokesman explained. He reported that at least one data base operator is changing its computer software so that users who call via Vpatt can be accommodated even if they are not subscribers to the data base service.

New England Telephone is exploring the possibility of using the Vpatt monitor screen to display advertising messages, Tibbets said. The system has a memory capacity of up to 94K bytes, and a single screen requires 1K bytes. Currently, the information is formatted at a central site and stored on a cartridge, which then is hand-carried to the phone and manually inserted.

In a paper presented at Videotex '84, Tibbets said that a color monitor, along with a NAPLES decoder, will be added to Vpatt in September. NAPLES, which stands for North American Presentation Level Protocol Syntax, is a videotex display formatting standard developed by AT&T, but based largely on Canada's Teldex protocol.

## At Boston airport, mixed reactions to videotex terminal's first flight

## It's too new, some claim

By Lynn Weber  
Clt Staff

**BOSTON**—Travelers who passed through a busy computer terminal here at Logan International Airport last week cast a curious but inquisitive eye at the latest automated device to populate the main lobby. But while they used the other computerized devices in the Eastern Airlines terminal—an automated teller machine, a machine that dispenses tickets and boarding passes, even an IBM Personal Computer XT micro that Big Blue had on display—with little hesitation, they shied away from the recently installed public access videotex terminal.

"I think it's too new," one traveler said. "Most people don't know about this type of thing yet."

The videotex terminal, installed for a three-month market trial by New England Telephone Co., lets travelers tap into hundreds of news, business, weather and other data

bases. It also lets them receive and send messages through electronic mail systems and link up with and use a home or business computer in another location.

"Good idea. I like it," was the sentiment expressed by one on-looker here last week. "I can see using something like this."

The videotex booth here at Logan includes a New England Telephone public charge-a-call telephone, CMT terminal and keyboard. A user dials the telephone number of the particular service he wants to use and enters his New England Telephone Calling Card number and the individual password or code for the service or computer being accessed.

The telephone call is billed to the Calling Card number, and the company providing the videotex service



On photo left, a New England Telephone's videotex at Logan International Airport

bill the customer for time used in its usual manner. National and local networks available on the New England Telephone videotex terminal include Comnet, Inc.'s Businessnet; CompuServe, Inc.'s Compuserve; General Videotex Corp.'s Delphi; MCI Communications Corp.'s MCI Mail; GTE Telecomm. Communications

Corp.'s Telnet; Tymshare, Inc.'s Tymshare; United Telecom's Uninet; and Comshare Computing Services' Yellow Data, according to New England Telephone.

Most of the networks that are currently available are subscription services, and only registered users can access those data bases. Yellow Data, a network that is advertised on the videotex display terminal as "New England's Public Access Video Publication," provides a calendar section,

a professional directory as well as a classified section.

Directronix, a soon-to-be-available service that does not require a number or password, is said to be an electronic guide to restaurants, shops and entertainment, a spokesman said.

## Business travelers targeted

"We believe this service will be convenient in areas frequented by business travelers," according to a spokeswoman for New England Telephone.

"We're offering this service on a trial basis to determine whether there is sufficient interest to warrant expansion to other locations throughout New England, including other airport locations, hotels and convention centers," she went on to say.

According to New England Telephone, the videotex station, which is presently situated against a wall out of sight from the terminal entrance and airline ticketing counter, is slated for future relocation. Using the airline schedule display terminals—a more centralized and visible area of the airline's main lobby.

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## Wang makes videotex debut

**CHICAGO**—Wang Laboratories, Inc. made its entry into the videotex market here last week with a \$250 software-based decoder for users of its Professional Computer.

Available in June, Wang's first distinctive resident decoder implements Prestel, the British videotex display formatting system. The company said it will soon offer decoders supporting the North American Presentation Level Protocol Syntax (NAPLES), developed by AT&T and supported widely in the U.S.; the French-developed Teletel protocol; and West Germany's Cept protocol.

To employ the PC Viewdata Decoder announced last week, a user of the Professional Computer (which costs approximately \$2,550) needs a Wang color monitor control card, priced at approximately \$400, and a

color monitor. To access remote data bases, a modem is also required. The resulting system reportedly displays text and graphics in up to eight colors and offers full blinking for highlighting portions of the text or graphics.

Through the decoder, a Wang Professional Computer user can access remote public or private data bases employing the Prestel format or can interact with Prestel-encoded videotex frames stored locally. The Wang Professional Computer's Winchester disk holds 2,500 videotex frames, while the system's diskettes hold 300 frames each, according to the company.

Additional information about the decoder is available from Wang, which is headquartered at One Industrial Ave., Lowell, Mass. 01851.

## NEWS

# Applicability of videotex to business users debated



## CW AT VIDEOTEX '84

By Phil Hirsch  
CW Washington Bureau

CHICAGO — There was much talk about business applications for videotex here at the Videotex '84 conference last week, but little was said about why business users would — or should — invest in the technology. Tom Taylor, vice-president for advanced network applications at GTE Telenet Communications Corp., came closest to addressing this question when he said the retrieved data must provide "perceived added value" to the end user.

Like most of those who spoke about business applications of videotex, Taylor indicated that growing use of personal computers in the nation's front and back offices will lead to the growth of the videotex market. "The current microcomputer boom will continue to open the market in a very aggressive... fashion," he said.

According to Taylor, there are 3.5 million personal computers in use by business. Twenty-five percent of these are equipped with modems, and this percentage [will increase] to over 50% by 1987. In addition, Link Resources Corp. has estimated that by 1987 there will be almost 60 million

personal computers installed in the U.S., 19 million of which will be in business, he said.

Somewhat different figures that nevertheless reflected the same general trend were presented by Brian T. Dugan, vice-president of the Gartner Group, a Stamford, Conn., consulting firm. Dugan predicted that by 1990, U.S. business will be employing 62 million white collar workers using 59 million personal computers, of which 23 million — approximately 40% — will be equipped to communicate with videotex data bases. Today, by comparison, there are 48.6 million white collar workers and 4.9 million "white-collar" personal computers in

use, of which 400,000 support videotex.

Dugan also said that 80 videotex system operators currently offer a total of 1,900 public access data bases; these will earn \$47 million in access and subscription fees this year. Their current compound annual growth rate is 78%, according to Dugan, who added that corporate customers account for the bulk of their business. He expects this pattern to continue until 1987, when home applications of videotex will begin to predominate.

Another view into the future of nonresidential videotex came from Thomas Rauh, a retail merchandising

consultant at Touche Ross & Co. Videotex, he said, "won't play a significant role in retail marketing until the late '80s or early '90s." Rauh said this would be the case even though retailers in general are earning smaller profits and facing stiff competition from discounters, mail order merchandisers and others offering "no frills" shopping and even though "electronic merchandising" promises higher profit margins.

Perhaps the most limiting factor in the growth of videotex shopping, Rauh said, "will be the consumer's reluctance to trade the excitement and pleasure of a store visit for the convenience of at-home shopping."

## Videotex out from Honeywell

CHICAGO — Honeywell, Inc. displayed its first two business-oriented videotex systems here last week at Videotex '84. Each system carries a base price of about \$125,000; user terminals are priced at \$600 to \$1,000 each.

Typical installations of either system reportedly would serve 600 terminals.

One system, Infonow, utilizes network software and a user terminal developed in France and resides on a dedicated Honeywell DPS 8 minicomputer. The other system, Retrv, was developed in England and employs either a dedicated DPS 8 or part of the capacity of a Honeywell DPS 8 mainframe. It typically interfaces with the user through Prestel-based videotex terminals, which may include a key pad instead of a keyboard and/or a standard TV set instead of a CRT screen.

Typical applications of Retrv and Infonow include electronic mail and messaging, legal and contract document retrieval and editing, telephone directory listings, purchase order files, product directories, price lists, organizational data and product reference libraries. The systems are particularly appropriate where there is a need to make large volumes of information available to many users.

While Infonow and Retrv are the first two videotex systems to be marketed by Honeywell, the company earlier became a partner in Keycom Electronic Publishing, Inc., which recently began marketing a home videotex service based in Chicago.

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## NEWS

## Justice halts DP leasing schemes as tax shelters

By John Galtieri

**SAN FRANCISCO** — In conjunction with the U.S. Internal Revenue Service's efforts to crack down on illegal tax shelters, the Justice Department's Tax Division has obtained a consent agreement against the promoters of a shelter involving sales of computer hardware and software.

According to a Tax Division spokeswoman, investors were sold "grossly overvalued" computer systems, which they would lease back to the defendants. The systems were then made available for leasing to local businesses, and investors were able to claim excessive income tax deductions and credits based on the purchases of the computer equipment.

Named as defendants in the suit from which the consent agreement stemmed were Computer Alternatives, Inc. of Larkspur, Calif.; its president, Robert E. Ramers; and John M. Holdaway, owner of Computaster Financial Services of Sandy, Utah. The agency's suit for injunctive relief was filed concurrently with the consent agreement, which was approved by a U.S. District Court judge here April 6.

The agreement enjoined the defendants from selling the C/A Tax Shelter, offered to investors since 1982. In separate agreements with the IRS, Ramers and Computer Alternatives were ordered to pay \$30,000 in penalties, and Holdaway was ordered to pay \$20,000, the spokeswoman said.

The Tax Division's suit claimed that, for 1982 alone, the potential loss in tax revenue to the U.S. Treasury resulting from sales of the shelter was in excess of \$2.2 million. No estimate of potential tax loss was given for 1983.

Filed at the request of the IRS, the suit charged the defendants with violating the Internal Revenue Code by organizing and selling the C/A Tax Shelter. The agency alleged that investors claimed interest, expense and depreciation deductions and investment tax credits based on the overvalued computer systems.

During 1982, the spokeswoman said, 101 systems were sold to investors at prices ranging from \$24,900 to \$60,328.

She explained that investors would pay a small down payment on the computer hardware and software and then agree to pay the balance in installments. The investors would simultaneously lease the systems to Computaster Financial Services, which would then assume

the installment obligations.

The suit maintained that the pricing of the computer systems lacked economic substance and that investors had no reason to bargain for lower prices since "the tax benefits... were sufficiently advantageous to make the remaining economics of the investment insignificant."

Computer Alternatives' Ramers told *Computerworld* that he and Holdaway entered into the consent agreement to avoid a costly and lengthy legal battle with the Tax Division. He said the agency objected to the C/A Tax Shelter because it claimed the defendants had overestimated the value of

the vertical market software packages included with the computer systems, an allegation Ramers continues to dispute.

Ramers claimed the IRS' year-long investigation "virtually destroyed" Computer Alternatives, which he said was formerly a "thriving, \$5 million-a-year systems

house." He added that most of the computer systems sold to investors through the C/A Tax Shelter were based on the Altos Computer Systems, Inc. Altos Series 5 microcomputer in combination with financial planning, insurance and real estate industry software packages developed by Holdaway.





## NEWS

# Wang agrees to buy into maker of switching systems

By Peter Bartels  
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. last week announced it had agreed in principle to purchase 16% of Intecom, Inc. of Allen, Texas, a manufacturer of communications switching systems and related communications products.

Subject to approval by the boards of directors of both companies, Wang initially will purchase 1.5 million shares directly from Intecom at \$15 each, for a total of \$22.5 million. Later in the year, Wang said, it would acquire an additional 3.5 million shares either publicly or from Intecom, for a total

price not to exceed \$66.5 million, or as much as \$10 per share.

The agreement limits Wang's future stock acquisition to a 30% ownership share and provides for up to two Wang representatives to take seats on Intecom's board of directors.

C. Michael Bowen, presi-

dent and chairman of Intecom, told Computerworld that the agreement hinges on technical and marketing considerations and said capital investment considerations "were absolutely not any force at all" in the negotiations.

He noted that the company has "a considerable

amount of money in its coffers" and could go back to the marketplace at any time for further capital.

At the end of 1983, Intecom reported in its annual financial report cash assets of \$66 million.

In a prepared statement, John F. Cunningham, Wang's president and chief executive officer, said the market requires and Wang intends to provide "a single network that allows telephone and computer equipment to transport information with equal ease."

Frederick A. Wang, executive vice-president and chief development officer, said the agreement "represents a major expansion of our communications capabilities and will allow users to run the applications and services they need over a choice of either coaxial cabling or telephone wiring."

Intecom, in recent months, has obtained prestigious contracts to supply its Integrated Business Exchange family of switching systems to three regional holding companies: New York New England Telephone Co., Bell Atlantic and Southwestern Bell Corp.

Wang said it still intends to pursue its open architecture philosophy and to promote interfacing and integration with other leading private branch exchange vendors.

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## HP, China to join forces

FALO ALTO, Calif. — On the eve of President Reagan's visit to China, Hewlett-Packard Co. last week announced that it has reached an agreement in principle to set up a joint venture company to manufacture and sell its products in the world's most populous country.

China-Hewlett-Packard Ltd. will be owned 60% by HP and 40% by the China Electronics Import and Export Corp., a foreign trade organization within the Chinese Ministry of Electronic Industry, which represents more than 2,000 electronics enterprises in the country. The agreement calls for HP to establish a headquarters facility in Beijing and specifies the construction of a manufacturing facility in China at a yet-undetermined time and location.

HP said the joint venture company will manufacture selected products from its current line of computer and electronic instrumentation products to be sold primarily within China.

## NEWS

## Voice/data PBXs: More than today's users need?



## PRODUCT SPOTLIGHT

By John Ditz  
Civ Staff

The drive to meet the evolving need for flexible data communications within the office has pitted two technologies against each other: private branch exchanges (PBX), which can carry data as well as voice, and local-area networks.

What these two technologies have in common is connectivity, or the ability to link one device with multiple resources. Each technology has been advocated as an end-all solution for office data communications needs. According to present conventional wisdom, however, local networks and voice/data PBXs will coexist.

There are four general "generations" of PBXs, depending on who is supplying the parameters to make the distinctions:

■ The first-generation PBXs were electromechanical cross-bar types of switches.

■ The second generation typically included switches with stored program control, but were limited in their ability to handle data.

■ Third-generation PBXs are all digital and provide, among other things, increased data-handling capabilities, support for both digital and analog telephone transmissions and the ability to be interfaced to computers and digital communications trunks.

■ Fourth-generation switches exist, for the most part, on manufacturers' drawing boards. Companies like Zitel Corp. in Wilmington, Mass., and CXC Corp. in Irvine, Calif., claimed that their switches provide voice communications, but have internal local-area networks that will eventually provide the higher speed capabilities associated with local networks. The verdict on switches of this generation is still out, withheld until it can be seen if the products live up to their design expectations.

Ironically, users of third-generation switches,

the type supplied today by the major PBX vendors (see chart), are barely tapping their PBXs' data-handling capabilities. Ian Angus, president of Angus Telemanagement Group, a Toronto-based research organization, claimed that "there are only a few hundred companies in North America that are switching data through PBXs."

Angus has found that users specify voice and data capabilities when evaluating PBXs, but end up using them as voice switches only. The fact that users specify data-handling capabilities at all when they are ready to purchase a PBX stems from their uncertainty regarding future needs, Angus believes.

***'Vendors are providing users with capabilities they don't want.'*** — George DeSalvo, International Data Corp.

"When looked at practically," he said, "manufacturers can't find users that want to go faster than 9,600 bit/sec asynchronously, even though most switches are now capable of supporting speeds up to 19.2K bit/sec asynchronously and 56K bit/sec synchronously."

Michael Schumer, vice-president and director of telecommunications at the Gartner Group, a Stamford, Conn., research firm, said that voice/data PBXs are an option for "companies that have done strategic planning and have found an evolving need for data switching." In other words, users are feathering their nests against future unknowns, insisting that their PBXs be able to switch data even if they do not have any immediate intention of using that capability.

Others agreed. "Vendors are providing users with capabilities they don't want," said George DeSalvo, director of International Data Corp.'s Communications Technology Service in Washington, D.C.

Nevertheless, most industry watchers agree that the voice/data PBX will play a role in future interoffice data communications. Angus is even

more adamant; he said that "the PBX will become a fundamental part of data communications," coming into its own because:

■ It provides users with switched access to many resources, including multiple mainframe environments, eliminating the need to have dedicated terminals for each application.

■ It is particularly useful for the occasional user, typified by the manager who wants to tap into various central data bases once in awhile and who uses applications such as electronic mail.

In both regards, the driving force behind the scene is the personal computer. Eric Kilborn, president of Hyatt Research Corp. in Andover, Mass., predicted that "the PBX will be best used as a resource-sharing hub, particularly for personal computers."

Angus concurred. "When people demand that their personal computers communicate, the PBX will be the simplest way to provide that access."

Schumer is not so sure. While he agreed that the personal computer is forcing the issue of data communications within the office, he saw the need being initially met by small local-area networks.

"Local-area networks are good for wrapping data within a small community of interest," Schumer said. "As the community of interest expands out of small work groups, the need arises to share information from one group with another, and that's where the PBX will fit in."

Some analysts warn that not all PBXs take well to data switching. PBXs of the second generation can be outfitted to switch data, but doing so can, adversely affect the device's main task, voice switching.

Ron Frank, managing director of Frank Communications Group, a research and consulting organization in Mount Vernon, N.H., said that "when a personal computer is logged onto a data base and run through the switch for hours, the voice-switching capacity of the switch will be affected."

Regarding the newer switches that have been designed to carry data, Frank noted that, beyond the technical feasibility of "crisscrossing apples and oranges into the same crate," there are some "per-

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	Terminated Support Parameters				Trunk Interfaces DS1, DSX, CP*	Local-Area Net Interfaces	Modem Passing	Notes
	Asynchronous	Synchronous	Full Duplex	Termination Interface				
Robot Corp. CBX-11	19.2K bit/sec	64K bit/sec	Full	RS-232C	DS1 DM: considering CP: yes	N/O	Yes	Terminals interfaced in phone, at phone or in stand-alone box.
Intertec, Inc. ISI 510, 580	56K bit/sec	56K bit/sec, 10M bit/sec burst mode	Full	RS-232C, RS-449, V.35, EIA-644 RS pin D-cable, IBM category A probe.	DS1 DM, CP: planned	N/O	Yes	Linknet - internal Ethernet-type network terminal interfaces in phone, at phone or stand-alone.
NBC Telephones, Inc. Nexar 2400	19.2K bit/sec	56K bit/sec	Full	RS-232C, RS-449, V.35	DS1 DM, CP: evaluating will support one	N/O	Yes	Terminal interfaces stand-alone only.
Stromberg Communications Systems, Inc. Spectrum 8, 9	19.2K bit/sec	N/O	Full	RS-232C	N/O	N/O	Yes	Terminal interfaces stand-alone only.
Northwestern Telecon Ltd. SL-1, SL-100	19.2K bit/sec	56K bit/sec	Full	RS-232C RS-422	DS1 CP	N/O	Yes	Terminals interfaced in phone, at phone or stand-alone.
AT&T Information Systems System 26	64K bit/sec	64K bit/sec	Full	RS-232C	DS1 DM CP: not new	N/O	Yes	Protocol conversion — AT&T BCT 500 & 515 terminals can emulate IBM 3278, 2780 & 3780 RJE, TTY-type terminals.
Intl Corp. SX3000	9.6K bit/sec	19.2K bit/sec	Full	RS-232C	None	N/O	Yes	"Mutually nonblocking" equates with one call blocked in 100.
RTS Omni Series 51, 52, 53	19.2K bit/sec	64K bit/sec	Full	RS-232C V.35	DS1 DM, CP: evaluating	Through 3.2K	Yes	"Mutually nonblocking" equates with one call blocked in 100.
Swift Data Systems, Inc. Jr. Exec	9.6K bit/sec	N/O	Full	RS-232C	None	N/O	Yes	Terminal interfaces stand-alone only.
Zitel, Inc. Private Network Exchange	19.2K bit/sec	56K bit/sec	Full	RS-232C	DS1 will support both DM, CP	N/O	Yes	Has internal local-area network primarily used for system control, will provide for high-speed data later.
CXC Corp. Cox	19.2K bit/sec	64K bit/sec	Full	RS-232C	None	N/O	Yes	Has internal local-area network primarily used for system control, will provide for high-speed data later.

N/A - Not Available.

N/O - Not Offered.

\* Trunk Interfaces — DS1 is the machine interface for 1.544M bit/sec T1 carrier facilities. DM (AT&T's Digital Multiplex Interface) and CP (Northern Telecom/Digital Equipment Corp.'s Computer-to-PBX interface) are used to connect computer to PBX.

CP ext.

## NEWS



## PBX SPOTLIGHT

## Why you might not need a digital PBX

One of the appealing aspects of switching data with in-house telephone facilities is that telephones and their gray wire are ubiquitous in nearly all organizations.

But you do not need a modern digital private branch exchange (PBX) to exploit that fact.

Simply by using modems, any office telephone system can be used to switch data within an organization. This does, however, tie up two telephone extensions, one, during busy hours, it can sap the capacity of the switching system, resulting in the inability to get a dial tone.

Notwithstanding those drawbacks, this approach can still be used effectively to get around the installation of dedicated wiring for occasional use devices, providing the number of devices supported in this manner is limited.

If that sounds too risky, there are other approaches that take advantage of the installed telephone wire but avoid the switching apparatus. These alternatives obviate the need to support equipment by running dedicated wires that, in the case of coaxial cable, cost \$3 to \$7 per foot.

The DCS-2 Data Carrier System manufactured by Teltone Corp. of Kirkland, Wash., is typical of the products of this ilk also available from, among others, Micom Systems, Inc. and Gandalf Data, Inc. The DCS-2 uses data-over-voice technology to support asynchronous data simultaneously at speeds up to 9,600 bit/sec and voice conversations over a single twisted-pair telephone wire.

In application, a desktop device provides an RS-232 interface for terminal equipment and an RJ-11 modular jack to connect the telephone. The interface, which connects to any standard telephone wire, superimposes the data stream from the terminal equipment onto a frequency higher than that used to carry the voice signal.

In the PBX room, a similar device is used in re-

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## Users exhibit range of enthusiasm

Manufacturers of private branch exchanges (PBX) that can handle both voice and data admit that very few of their users ever tap their switches' data-handling capabilities. The few that do vary in their enthusiasm.

The University of Chicago installed three Intecom, Inc. IBX 640s two years ago to replace its Onsite system. Besides their usual jobs of switching voice, the Intecom devices now support most of the university's terminals.

Patricia Toden, the school's manager of telecommunications, said that week, although not all of the dedicated coaxial cable facilities have been removed since the PBXs were put in place. The PBXs link roughly 8,300 asynchronous and synchronous terminals to a number of host computers, including hardware from IBM and Digital Equipment Corp.

The University of Chicago has one Ethernet local-area network. As others are deployed, Toden said, the school intends to link them with the PBX.

At Westinghouse Electric Corp. in Pittsburgh, data is being switched through the new PBXs that are being installed as the company moves to integrate voice and data. "Given the growth in data applications and the need for information exchange," said Bob Donale, manager of communications systems, voice and data integration with a PBX "seems like a sensible and easy way to go. Why have separate voice and data networks?"

The down side of integration, Donale pointed out, is that "if you lose a switch you lose an awful lot." So integration is not being pursued haphazardly at Westinghouse.

"We're not ripping things out to say we've integrated," Donale said. "The direction we're going in manufacturing and in the office suggests that you want to have a wire facility that enables you to use terminals and personal computers to the fur-

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## CPU, PBX vendors drawing alliances

The alliances being drawn between manufacturers of computers and manufacturers of voice/data private branch exchanges (PBX) are indicative of a growing belief that the digital telephone switch will play an important role in future intranet data communications.

IBM and Wang Laboratories, Inc. believe it, so can be persuaded by their respective moves to acquire pieces of switch manufacturers Rolm Corp. and Intecom, Inc. (see story page 13).

Other computer manufacturers believe it, too. Over the past year, many reached agreements with various PBX vendors to certify compatibility between their products. Some of the notable testing agreements include:

■ Northern Telecom, Ltd. with Digital Equipment Corp., Wang, Prime Computer, Inc., Hewlett-Packard Co., Data General Corp. and Sperry Corp.

■ AT&T Information Systems with Wang, HP, DG and Honeywell Information Systems.

■ Rolm with HP, DEC and DG.

Switch manufacturer Intecom said that with some interaction of the various computer makers, it has developed interfaces for products from Wang, DG, DEC, IBM, HP and Prime. Vendor companies in both the computer and PBX camps are also now studying the computer/PBX interfaces that have been recommended as standards to the Electronic Industries Association by the teams of Northern Telecom/DEC and AT&T/HP. Those interfaces, which are incompatible, specify the number of channels and the type of control signaling used to connect a computer to a PBX through one of its 1.544 bit/sec trunk interfaces (CW, April 2).

Northern Telecom/DEC and AT&T/HP. These interfaces (CPI) has the endorsement of computer vendors Wang, DG and Prime and the support of switch makers Rolm, Mitel, Inc. and Intecom.

AT&T's recently announced Digital Multiplexed

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	Architecture	Required Environment	Maximum # of Ports	Bankswitching for busy status lines	Telephone Bells Supported	System Wiring	Price/Line	Ported Connections
Rolm Corp. CR-2	Modular switch with distributed architecture based on TDM bus	Switchroom	34-10,000	All	Digital, Analog	1 pair - twisted, recommend 3 pair	\$800-\$1,000	Asynch. to BIC, SCLC & X.25
Intecom, Inc. IBX 510, 580	Modular switch with distributed architecture and central control based on TDM bus	Switchroom	810-250-2,000 580: 1,500-8,200	All	Digital, Analog	2 pair - twisted	\$1,000	Asynch. to BIC & X.25
NEC Telephones, Inc. Neer 2400	Modular switch with distributed architecture based on TDM bus	Switchroom	184-23,184	All	Digital, Analog	2 pair - twisted	\$800-\$1,200	N/A
Siemens Communications Systems, Inc. Sarum X, B	Fixed slot switch based on TDM bus	Office	B: 224 B: 832	All	Digital, Analog	2 pair - twisted	N/A	Range of these
Northern Telecom Ltd. SL-1, SL-100	Modular switch with distributed architecture and centralized control based on TDM bus	Switchroom	SL-1: 32-5,000 SL-100: 5,000-30,000	1,800 lines in max. configuration of SL-1 All for SL-100 if needed	Digital, Analog	2 pair - twisted	\$800-\$1,000	Asynch. to BIC, SCLC
AT&T Information Systems System 85	Modular switch with distributed architecture based on TDM bus	Switchroom	400-7,000	Totally reconfigurable for 4,000 lines, or "essentially reconfigurable"	Digital, Analog	Recommend 4 pair twisted	N/A	See notes
Mitel Corp. SL3000	Modular switch with distributed architecture based on TDM bus	Office	400-3,500	"Virtually non-blocking" for all lines	Digital, Analog	2 pair - twisted, recommend 3 pair	\$800-\$900	N/A
BTE Onix Series S1, S2, S3	Modular switch with distributed architecture and central control based on dual TDM bus	Switchroom	50-3,000	"Virtually non-blocking"	Analog	1 pair - twisted partly speed	\$700	Asynch. to X.25 conversion
Bull Data Systems, Inc. D. Exec	Modular switch based on multiple TDM buses	Office	4-200	All	Analog	2 pair - twisted	N/A	N/A
2nd, Inc. Private Network Exchange	Modular switch with distributed architecture using time/space/time division	Office	150-30,000	All	Digital, Analog	2 pair - twisted	\$800-\$1,000	N/A
DEC Corp. Ross	Modular switch with distributed architecture based on TDM bus	Office	192-12,000	1,000-3,400	Digital, Analog	2 pair - twisted	N/A	N/A

N/A - Not Available

N/A - Not Offered

CW cont.

## NEWS

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ous implementation problems with integrating voice and data." According to Frank, "They don't always play well together, like trying to play 45 rpm and 33 1/3 rpm records together."

Voice and data traffic differ — although both exist in digital form within a digital PBX — in permitted bit error rates (digitized voice does not require the low bit-error rates needed for data), frequency of access and typical duration per session of use.

Angus commented that while traditional data "conversations" are longer in nature than voice conversations, he has found that personal computer data traffic is similar in duration to voice conversations and has

"less of an effect on PBX traffic than dumb or intelligent tubes."

Kilborn presented another opinion, cautioning that personal computer communications sessions are not always short-lived. "A PBX can be used up if users are doing a lot of printing on remote devices or using the switch to access remote storage devices frequently," he noted.

User requirements are not static, however. As higher capacity disk drives are hung from personal computers, their users will find more occasions to try to pull larger hunks of data through the PBX.

To meet those evolving needs, Angus believes that PBX manufacturers will eventually have to support 256K bit/sec, a speed that would enable a single megabyte file to be transferred in roughly four seconds.

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verse to strip the data signal off the wire and provide an appropriate computer connection. The data stream never passes through the PBX.

The per channel, end-user cost for a typical system supplying support of asynchronous traffic to 9,600 bit/sec is \$450, according to a Telos spokesman. Reportedly, Telos has sold upward of 30,000 DCS-2 channels.

A synchronous version of the DCS-2 system that supports traffic at 19.2K bit/sec is said to be in field trial.

Davox Communications Corp. of Merrimack, N.H., also markets products that take advantage of existing telephone wiring, although its sys-

tem can only be used with its proprietary terminals. Collectively known as Davoxnet, the terminals have built-in telephones and can operate as an IBM 3278 Model 2 terminal, a DEC VT100 or a teletypewriter-type asynchronous terminal. Additionally, the terminals can communicate with IBM Personal Computers. Users can also use the terminals to have modes of operation with the push of a button.

Instead of using data-over-voice technology to offer simultaneous support for data like Telos, Davox pushes data over the unused wires that run up to the back of every telephone. Telephones typically use only two of the six wires run through a building.

Davox, like Telos, picks up the twisted pair used for data in the PBX room, the central point where all telephone wires are gathered, and routes them to an appropriate device.

USERS from page 15

chest extent possible."

The PBX can provide that flexibility and is doing so at Westinghouse where the need arises. Dennis noted, however, that he hasn't found any need to use the 68K bit/sec data capability of some GTE Corp. PBXs the company has. "Where we need those speeds," Dennis said, "we are already providing support with dedicated wires."

At Ford Motor Co. in Dearborn, Mich., only a small number of the 800 or so PBXs located throughout the company are carrying data. The little data switching that is done is generally at 9,600 bit/sec between terminals and computers, according to Mayford Bosk, executive director of systems.

## Access to multiple resources

At Schwinn Bicycles Co. in Chicago, the PBX is regarded as a possible means to provide computer users with transparent access to multiple resources. Bob Walsh, director of MIS, said Schwinn will be installing a PBX within a year to replace the Centrex service it currently has. The company is presently investigating the PBX as a method of delivering voice and data integration, Walsh said.

Hills Bros. Coffee, Inc. in San Francisco, has no big plans to switch data through its three-year-old Bittich America Ltd. PBX.

Roger Frow, manager of telecommunications, said that the company has "more than 100 terminals that are already cabled and have been that way for years" that while his switch could probably support some of them, Hills Bros. doesn't "need to use it that way."

The company did need to be able to access different computer resources from the same stations, but instead of turning out the voice switch to install new PBXs, Hills Bros. installed a Micom Systems, Inc. data switch in the computer room.

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Interface for the same application has been backed by HP (formerly a CPTI supporter), DG and Honeywell and is reportedly being studied by PEK manufacturers Rolm, NEC Telephones, Inc., Intecom, and GTE Business Systems Corp.

# UNIX & C

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## NEWS

## This DP auditing job calls for more than auditing

### Medical insurer requires winning personality, writing ability

By David Meyers  
Of New York Bureau

**NEW YORK** — While many Fortune 500 corporations here go looking for senior systems analysts, Blue Cross and Blue Shield of Greater New York faces a special problem: finding programmer analysts with a knowledge of accounting combined with a winning personality and an ability to write.

Why does New York's largest health insurer need programmers with such a special blend of skills? To examine and check the work of other programmers and systems analysts, that's why.

"That's our job," noted Francis X. Peo Jr., the new assistant vice-president in charge of auditing at Blue Cross/Blue Shield.

"We say, 'We're from DP auditing, and we're here to help,' and [the data processing professionals] just laugh. There are three great lies of man, you know, and that's the third one," Peo said.

Peo was named to head the auditing operations last October after serving as director of financial evaluation and control for the New Jersey Casino Control Commission. A certified public accountant, he began his

career with Deloitte, Haskins & Sells, one of the Big Eight accounting firms.

Staff of 19

Blue Cross/Blue Shield's auditing division encompasses program security, internal auditing and DP auditing.

Its DP auditing staff of 19, under director Eugene Assante, has the job of keeping track of the 1,100 DP workers, five mainframes, 27 minicomputers and nine word processing units at the health insurance carrier.

"Only on occasion do we recommend that they replace a system," Assante said.

"But we never suggest a specific piece of hardware to improve their work. That's outside our purview. They've spent their lives doing hardware evaluation. To take that decision away from them would be preposterous," he said.

Moreover, he pointed out, if a DP auditor becomes "induced by the decision-making process, it's very hard to come in later and judge [the system's] effectiveness."

By its very nature, auditing breeds a certain amount of tension, as anyone who has ever been audited by the

Internal Revenue Service well knows. At Blue Cross/Blue Shield, a DP auditor shows up in the data center hand-in-hand with a coworker, an internal auditor.

"Both guys show up at once, and the guy [who is being audited] panics," Assante laughed.

That tension, however, is fueling the growth of DP auditing as a profession.

"We're not looking for exactly the same qualities [as in a DP employee] when we hire a DP auditor. But he has to know DP. [The data processing manager] will run right over you if they think they can get away with it," Assante said.

Assante listed several areas of knowledge he considers essential for an adept DP auditor: Cobol, PL/I and OS/JCL. But, he complained, "none of the colleges seem to teach OS/JCL any more. It takes us 36 hours to teach someone."

Assante expects a newcomer to his DP auditing team to be familiar with data base management, preferably Cincom Systems, Inc.'s Total system, which has been adopted by Blue Cross/Blue Shield.

The DP auditor should know system design as well.

Peo added that the health insurer is searching for people with both DP knowledge and accounting skills, plus "the right personality for dealing with people who are often a bit defensive." The DP auditor should also be able to write, since an audit of the data center results in a written report.

Hard to find

Who has such a blend of talents? Assante admitted such employees are hard to find, and the shortage of qualified personnel has been delaying his staff's reports by up to three months.

Peo mentioned a summer internship program arranged for students at New York University, but Assante seemed to believe that most good candidates will drift over from the DP department. Assante himself is a trained programmer.

"If you're a DP manager, you have 100 people working under you, and that's good for your ego. But you also have to do a lot of fire fighting. Here [in DP auditing] you can get things done. Plus, for the first time, you can step back and see the whole operation. That's the real enticement," Assante said.

## Two indicted for smuggling high-tech equipment to Asian nations

**LOS ANGELES** — A San Diego area businessman and a Hong Kong man have been indicted by a Los Angeles federal grand jury on charges of smuggling computer calibrating and testing equipment to several Asian nations, including the People's Republic of China.

The 17-count indictment, handed up earlier this month, charges William T. Newkirk, 46, president of Kai Tek Labs, Inc., with eight counts of failing to gain required export licenses for the equipment and eight counts of filing false statements with the U.S. government regarding the contents of those alleged shipments.

Newkirk allegedly shipped the

equipment to Hong Kong businessman Man Chung Tung, who, in turn, allegedly sold it to buyers in the Philippines, Malaysia, Hong Kong and the People's Republic of China.

Assistant U.S. Attorney William P. Fahy placed the value of the equipment at "hundreds of thousands of dollars," but would not specify the models of the products that were allegedly shipped.

Among the companies from which Newkirk allegedly purchased the equipment are Hewlett-Packard Co. and Tektronix, Inc.

Newkirk, according to press accounts, surrendered to federal authorities in Los Angeles April 6.

Tung, who also faces eight counts of failing to obtain an export license, was expected to surrender shortly afterward.

Fahy said Newkirk's alleged shipments to Tung were carried out between September 1983 and August 1983 and were uncovered as part of

the U.S. Customs Service's Operation Exodus, an attempt to stop the flow of high-tech equipment to the Soviet-bloc nations and the People's Republic of China.

None of the shipments was confiscated before leaving the U.S., Fahy said.

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## NEWS

# Standards lack, misconceptions hinder AI boom: speaker

By Tom Heston  
CW Staff

**BOSTON** — Confused by a lack of standards and possibly suffering from misconceptions over the results they might achieve, users often do not know what to expect from artificial intelligence products. As a result, many settle for too little or expect far too much from an AI system.

That was the opinion of one consultant who pointed out during a conference here last week that many issues have to be resolved before AI leaps to the forefront of the information processing industry.

Like other speakers at the Artificial Intelligence Conference, sponsored by the Data Processing Management Association's Education Foundation, Dr. John H. Clippinger, president of Brattle Research Corp., a Cambridge, Mass., consulting firm, said the market for AI products will boom. But such an explosion may be delayed until the AI industry overcomes some early growing pains.

## Severe identity crisis

For example, Clippinger said, makers of AI products suffer from a severe identity crisis. The term "AI" is used to cover several different industries including natural languages, expert systems, vision systems, voice recognition systems and intelligent robots. It is unlikely, if not impossible, for any one vendor to offer products aimed at all market segments, Clippinger said.

Furthermore, he noted, many potential corporate users of AI products have yet to be convinced that AI is the

only way to solve a particular business problem. Consequently, many turn to conventional computing to efforts to solve their business problems instead of bearing the cost and uncertainty of an AI project.

When faced with the relatively high hardware and software costs associated

with AI, some users who do experiment with it stop at development and wind up with an application that is not very useful, Clippinger said.

But an identity crisis is not the only problem facing early vendors and planner users of AI products, according to Clippinger. He noted

that there are virtually no standards in the burgeoning AI industry. For example, he said, there are at least nine versions, or dialects, of Lisp, a popular language for AI software development. Most of these dialects possess enough differences to make it very difficult to convert an application from one dialect

to another.

Clippinger also stated that since none of the major computer system vendors — like IBM, Digital Equipment Corp. or Hewlett-Packard Co. — has formally jumped into the AI market, the lack of standardization will probably continue until a major firm sets a de facto standard.

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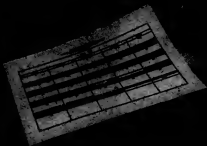
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**ARLINGTON, Texas** — Approximately 190 attributes of computer-aided design and manufacturing (CAD/CAM) systems are compared to more than 40 CAD/CAM system suppliers' offerings in the CAD/CAM Presentation Resource Guide published by the University of Texas at Arlington.

The 400-page, loose-leaf guide covers such topics as CAD/CAM graphics systems, group technology, computer-aided process planning, numerical control, manufacturing management systems, robotics and automated storage and retrieval systems.

The guide costs \$125 from the Office of Continuing Education, University of Texas at Arlington, Arlington, Texas 76019.

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## NEWS

# Nata asks FCC to control 'chaos' in telephone marketplace

By Bryan Wilkins  
Of Washington Bureau

KANSAS CITY, Mo. — A leading national trade association last week accused the Federal Communications Commission of adopting a blind-faith approach to deregulation while the telephone marketplace is "escalating into chaos" four months after the dissolution of AT&T.

The "telecommunications marketplace is a mess," according to the North American Telecommunications Association (Nata), which represents 600 independent telephone equipment manufacturers. "Customers are facing increasing delays in receiving timely service, sometimes having to

wait for two months or more for the phone companies to provide the long-distance connections they used to receive in a matter of weeks.

"The ruthless price wars that have plagued the communications equipment and computer industries for the past two years are accelerating... sparked by the aggressive reentry of the divested Bell operating companies into the equipment market and the 'fire-sale' of in-place AT&T products," Nata President Edwin Spievack said recently in a speech to the Mid-American Telecommunications Association here.

Spievack said that federal and state policymakers are scrambling to

get a hold on the chaotic situation, but are not succeeding. Instead, they are delaying the implementation of access charges while they search for new initiatives.

Spievack likened the present competition in the telecommunications markets to the situation that existed in the early 20th century, when "the business environment was a jungle, dominated by giants." He called for a new, competitive environment that "strikes a rational balance between pervasive regulation of government franchised monopolies, which characterized our past, and laissez-faire, cutthroat competition, which is fast becoming our future."

Spievack said that the pending federal judge in the U.S. vs. AT&T antitrust trial has a vision of divestiture "which means simply a hand-off dominated by Goliaths, a series of Star Wars clashes between AT&T, the divested Bell operating companies, IBM and... a few others."

He called for the FCC and the court to require that the divested Bell operating companies devote their primary attention to the provision of local telephone service before meddling into "the riskier markets for business equipment, enhanced data services, long distance and even commercial real estate."

Specifically, Spievack called on the FCC to establish a national service center that would be responsible for ensuring that telephone customers are getting the delivery of telephone service universally, uniformly and efficiently.

"Given the escalating chaos in the industry, it's time for the commission to get off the sidelines and take affirmative, aggressive steps to ensure that all users receive the basic service they need... which must include the monitoring on a national basis of the services performance by bottleneck suppliers, with particular attention to trouble spots," Spievack said.

At the same time, Spievack said that the cutthroat price competition will produce destructive results and wrinkle the very industries on which America depends. He called on Congress to investigate the issue.

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## Lottery to grant radio licenses

WASHINGTON, D.C. — Most of the remaining cellular radio franchises in the nation will be awarded by lottery, the Federal Communications Commission decided earlier this month.

The FCC also decided that its wire-line set-aside policy, which has been applied so far only to the 30 largest ("top 30") cellular radio markets, will be extended to smaller markets. Under this policy, half the available cellular radio frequencies are reserved for telephone companies and the other half for non-telephone companies.

The lottery process, by speeding up award of cellular radio licenses, will bring service to the user in less time, the FCC said. It cited four other reasons for deciding not to award licenses in markets below the top 30, one being the expense of the comparative hearing process.

A lottery also will "permit different system approaches to compete in the marketplace rather than in the hearing room," the FCC added.

The wire-line set-aside policy is being extended, the FCC said, because it will ensure large and small telephone companies of an opportunity to compete.

"Without separate allocations... the odds... would favor the more numerous non-wire-line applicants as a group, making significant wire-line participation unlikely," the FCC said.

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## NEWS

# DPers see Hart, Reagan supporting high-tech industries

## Unemployment, inflation, federal deficit primary issues for those polled

By John Brecken  
CW Washington Bureau

WASHINGTON, D.C. — Gary Hart (D-Colo.) and President Ronald Reagan were both perceived as supporting high-technology industries by DPers randomly polled at a recent conference here. Only a small percentage said Walter Mondale supports high tech, and none thought Jesse Jackson does.

Most respondents indicated they back either Hart or Reagan in the upcoming presidential election; Jackson and Mondale received little support for president. The poll data, however, does not provide a basis for concluding that the candidates' relative support for high technology or the respondents' party affiliation or some other factor is the major basis for the respondents' backing of a particular candidate.

The poll, conducted by Women in Information Processing (WIP) at last month's Federal Office Systems Expo, also found that unemployment, inflation and the federal deficit top the list of national issues worrying the approximately 300 polled, whose opinions were tabulated from a larger sampling of the 27,000 conference attendees.

WIP looked for respondents who were vendors or users and work mainly with micros, minis or mainframes and broke down their an-

swers to questions concerning, among other things, gender, age, party affiliation, salary, candidate preference and ranking of national issue concerns.

"Attitudes varied little depending upon salary, party affiliation, age, sex or whether the attendee was a user or vendor," WIP found. All respondents said unemployment, inflation, the national deficit, nuclear war, crime and foreign policy are of the greatest concern.

Respondents, of whom 60% were female and 40% were male, with an average salary of \$39,000, also said (by 80%) that they strongly favored a woman running for vice-president.

Janice Miller, WIP International president, said the organization will compare the poll results with opinion data from other industries and larger, less homogeneous groups "to see how different our industry is from the rest of the world."

In general, she said, the poll data confirms her impression that there is much more agreement on basic issues within the data processing industry than within other economic sectors. "I find it over and over again," she said. "We're just a different breed. Within this industry people are just different. . . . We're more futuristic; we're more excited about changes and challenges. It's a mindset."

WIP did find differences when the

poll results were tabulated by mainframe, mini and micro users and vendors. Mini users and vendors, for example, ranked unemployment fifth among their concerns, just behind equal rights, unlike mainframe and micro categories, which listed unemployment first. In fact, money issues seemed rather low on the list of concerns for mini users and vendors, and that was only one of several differences among the opinions expressed in that category.

While offering no theory on this difference, Miller said, "I was really surprised. Their [mini users/vendors] heads are so buried in the sand. They feel so secure in such a changing industry." Recent market research indicates the minicomputer industry faces a growing challenge from microcomputers and has the most to worry about in terms of unemployment, according to WIP.

The three categories provided the following information on party affiliation. The mainframe category was 60% Democrat, 22% Republican and 14% independent; the mini category was 42% Democrat, 33% Republican and 25% independent; the micro category was 52% Democrat, 30% Republican and 18% independent.

Support for the presidential candi-

dates was broken down as follows: females — 35% for Hart, 9% for Jackson, 15% for Mondale and 41% for Reagan; males — 51% for Hart, 2% for Jackson, 9% for Mondale and 38% for Reagan; mainframe users/vendors — 45% for Hart, 0% for Jackson, 27% for Mondale and 27% for Reagan; mini users/vendors — 56% for Hart, 0% for Jackson, 0% for Mondale and 44% for Reagan; micro users/vendors — 40% for Hart, 4% for Jackson, 19% for Mondale and 37% for Reagan.

When asked which candidate supports the high-tech industry, the mainframe category responded as follows: 45% for Hart, 0% for Jackson, 16% for Mondale and 39% for Reagan. The mini category responded 34% for Hart, 0% for Jackson, 4% for Mondale and 58% for Reagan. The last group, micros, were 32% for Hart, 0% for Jackson, 21% for Mondale and 47% for Reagan.

Finally, respondents were asked to rank in order of importance 15 qualities most desirable in a president. WIP said females and males agreed that honest and strong leadership are No. 1 and No. 2 in importance. The respondents also thought presidents should be both well-educated and fair-minded.

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## NEWS

## Cafe mixes video, micro; offers 'menu-driven' service

By John Goffett  
CW Staff

LAWRENCE, N.Y. — The claim is made so often that it has become something of a high-technology cliché — "the software is menu-driven." But one restaurant owner here has turned that phrase on its head. For the patrons of the Planet Earth Video Cafe, the menu is software-driven.

Set stylishly into the wall above each of the cafe's 30 tables is a 13-in. Panasonic Co. color television monitor connected to a bank of Panasonic commercial videocassette players. Customers seated at the tables or the bar, where additional monitors are located, can view any of the Planet Earth's three video channels simply by pushing one of the buttons beneath the monitor.

The cafe's "miscellaneous potpourri" channel offers a silent mix of movie clips, sports highlights and fashion show outtakes. A second channel highlights the music videos that are pounded out on the Planet Earth's sound system and simultaneously broadcast on the cafe's 8-by-10-ft television screen, according to manager William Chu.

But it is the cafe's Channel 1 — the computer-driven channel — that Chu said makes the Planet Earth different from any other restaurant in the nation. With a tap of the finger, customers can call up the cafe's ever-changing menu, which resides on a floppy disk on the Planet Earth's Commodore Business Machines, Inc. Model 64 microcomputer.

The Commodore micro is connected to one of the Panasonic videocassette decks, which transmits the disk information to the monitors. The menu actually consists of three different screens, each of which is formatted in different colors and remains on the monitor for 30 seconds to one minute in a continuously rotating cycle of culinary data.

The first screen outlines the Planet Earth's food selections, including the chef's specials, which are changed on disk from day to day. A second screen presents the cafe's wine list, and the third is a sort of electronic bulletin board that highlights upcoming events, which are also updated on disk each day. After viewing the menu, patrons place their orders with a waiter or waitress who, if necessary, can also instruct customers in the operation of the computerized system.

Chu said the electronic menu system was the brainchild of owner Ronald Pallaci, who also owns a chain of Wine Gallery restaurants located

across New York state. "The Planet Earth used to be a Wine Gallery restaurant, but for some reason it wasn't doing as well as the others, which do a fantastic business," Chu explained.

"[Pallaci] was looking for a different theme, one that combined video and computer technology. The idea seems to have really caught on since we made the changeover six months ago. We have increased our business between 50% and 75% in that time."



Illustration by K. VandenBerghe

Chu estimated that the computerized menu system, including the monitors, micro and videocassette decks, cost between \$15,000 and \$20,000 and required extensive remodeling — and rewiring — to install. But by allowing management to add or delete items instantly and revise pricing, Chu said, the system ends the problem of printing up new menus periodically, which can cost as much as \$2,000. The Planet Earth staff also

uses the Commodore micro to maintain inventory data and the cafe's mailing list.

"Initially we had the reaction that the setup was less than classy for a restaurant," Chu said, "but that was before people actually saw it. It's so professionally done that it's turned everyone around."

"Customers love it. The system grabs their attention, and it entertains them."

"Also, as soon as they sit down, they have a menu right off the bat, and nobody feels neglected if we're busy and can't get to them right away. It gives us that extra minute to prepare and serve them better."

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**COMPUTERWORLD**  
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## NEWS

## Cunard Line christens its floating computer center

NEW YORK — Nodded on the Boat Level of the Queen Elizabeth 2, with a view that overlooks the deck of the massive ocean liner, there is a room no passenger can look — for it is always occupied.

The room's occupants are always aboard, whether the QE2 is enroute to the far corners of the globe on an epic 80-day journey or simply meandering about the Atlantic Ocean on a three-day "cruise to nowhere." Amidst the nightlife, the revelry and the romance, the residents of this chamber sit silently.

These mysterious passengers are actually six IBM Personal Computers

placed on-board the QE2 as part of what Cunard Line Ltd. calls the first floating computer center. Manneby an instructor and equipped with a variety of software, the computer center is designed to give travelers an opportunity to catch up on their work or improve their computer literacy.

"We try to include on our cruises the things that capture the interest and imagination of the American public. Computers are something Americans want to use and something they want to learn about. We think a cruise is the perfect venue for professional people who haven't had

the time at home or at work to learn to use a computer. There are no distractions, and the atmosphere makes it less intimidating," said Alice Marshall, public relations manager for Cunard Line.

Use of the equipment and software is free of charge to passengers who reserve time in the computer center. Shortly after the 14-year-old ocean liner leaves its home port here, subscribing passengers are given an introductory lesson by the center's instructor, who is then available to provide one-on-one guidance. Marshall said every cruise offers a different instructor, each of whom is an

employee of IBM assigned to what can hardly be labeled a hazardous duty.

In addition to an array of word processing, spreadsheet and other business and entertainment software, the computer center also provides self-help packages that let passengers "learn by doing." Since the computers were installed aboard the 1,800-passenger liner in January, Marshall said, the center has been booked solid. If its popularity continues, the QE2's computer center will be expanded, and similar facilities may be offered aboard the Cunard Line's four other ships.

## Wang Institute announces summer courses for computer scientists

TYNGSBORO, Mass. — The Wang Institute of Graduate Studies will offer a series of short, noncredit courses for computer scientists at the institute's campus here from May through August.

The first course in the series, "Logic Programming Using Prolog,"

will be taught May 14-18 by Dr. Keith L. Clark, senior lecturer at Imperial College in London. The course will provide instruction in logic programming using Prolog and the use of Prolog for deductive data bases, general list processing and natural language parsing.

A course scheduled for June 4-8 on "Operating Systems" will provide instruction in small and medium-size operating systems using examples and exercises drawn from production systems and subroutines.

A course in "Software Engineering Principles" will be offered June 18-22 and will cover the use of specifications in the design of software and the design and synchronization of co-operating sequential processes, among other topics.

Courses in "Implementation of Relational Systems," "Introduction to

Interactive Computer Graphics," "Resource Modeling and Cost Estimation" and a "Software Project Management Workshop," among others, will be offered later this summer.

All courses in the series are priced at \$900, except for the "Software Project Management Workshop," which is \$1,300.

Further details regarding the Wang Summer Institute are available from the Coordinator of Special Programs, Wang Institute of Graduate Studies, Tyng Road, Tyngsboro, Mass. 01879.

## AMS '84 set for June in Chicago

CHICAGO — The importance of the computer in automated production will be the highlighted theme at the Advanced Manufacturing Systems Exposition and Conference (AMS '84), which will be held June 12-14 at McCormick Place here.

AMS '84 is intended for executives of manufacturing companies who are interested in information systems and automated production systems.

The keynote address, titled "The Knowledge Worker" — is Management Fostering the Bell? will be given by Jack C. McVickers, vice-president of operations for Martin Marietta Orlando Aerospace, Orlando, Fla.

The conference will include 63 sessions in 10 areas of interest to manufacturing executives. Four full-day,

intensive courses on robotics and personal computers also will be offered.

Registration fees for the AMS sessions will be \$286 for those attending all three days, \$160 for one day and \$86 for a half day. The robotics courses will cost an additional \$250 each, and the personal computer classes will cost \$265 each.

A software exposition and conference for information managers called Info/Software will be held at the same time and location at AMS '84. The event will require a separate registration fee.

AMS '84 and Info/Software are produced by Clapp & Poliak.

More information is available from the Show Manager, AMS '84, 909 Summer St., Stamford, Conn. 06906.

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## NEWS

# Programmer's tool kit seen needed for breakthroughs

By Robert Bates  
CW West Coast Bureau

**LOS ANGELES** — Programmers need to be equipped with a comprehensive tool kit if the software logic of the 1990s is to be broken, attendees at the recent Comdex/Winter '84 show here were told.

Fourth-generation languages on their own are insufficient to meet today's productivity needs, said Tom Love, a consultant at Micro Focus, Inc., a Palo Alto, Calif.-based manufacturer of programmer productivity tools. Speaking at a session on "Quick-Fix Program Generators," Love said, "It is clear that programmers are going to be around for some time to come. What we need to assist these professionals is a number of integrated programmer productivity tools.

"In fact, we need a programmer's tool kit," Love told his audience. He envisioned the kit including program generators, editors, optimizing tools (native code generators, for example) and debugging tools, as well as more design and maintenance tools.

"Given that typically 80% of a programmer's time is being spent on maintenance, it is clearly a sadly neglected area as far as productivity tools are concerned. There is a need for either ready-made code or products that self-document," Love said.

Love, who has worked for several years as a consultant in applications and systems development areas, said that while program generators are not the only way to break the backlog of applications projects, they are a useful aid.

In an interview following his speech, Love criticized current program generators for lacking the flexibility that users need.

"End users of applications rarely know what they want, and this often leads to extensive rewriting of programs. The problem with the program generators of today is that they do not exactly fit the needs of end users and value-added resellers," he claimed.

#### Not specific to users

Too many program generators, Love complained, are not specific to users or applications. They are spread across too wide a spectrum. "There is a need to have program generators for professionals and a need to have tools for the novice. Program generators should be developed with the end user in mind. . . . Vendors must be familiar with end-user requirements," he asserted.

Love contended that program generators are not real-

ly suitable for specific large-scale applications. Rather, they are good at quick-fix, vertical programs for users who do not know exactly what they want, but can discover their needs by generating programs.

For this reason, he added, program generators that use source code of a well-known

language, such as Cobol, are advantageous. Love enumerated a number of advantages reportedly possessed by program generators written in Cobol:

- They make standard data base acquisition programs rapidly.
- They generate error-

free code.

• They produce end-user documentation.

• They create standard Cobol source code.

Also speaking at the session was Job Long, staff technologist at Ashton-Tate, the manufacturer of the Dbase II software package, who called for more friendly pro-

gram generators that incorporate extra power and intelligence and are better documented.

"There is a whole new segment of the market opening up which is aimed at the casual user. We, therefore, have to find a better way of making systems more friendly," Long said.

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other systems require days or weeks of dictionary setup for each application, the extensive built-in knowledge base of RAMS II English provides immediate access to expert data.

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CM 480

## NEWS

## Blind programmer updating Cobol programs

**SAN FRANCISCO** — A blind programmer/analyst at Levi Strauss and Co. has eleven people without sight can do just as well as anyone in data processing, provided they have the tools to compensate. In his case, those tools are a talking terminal, a leader dog and an interactive testing and debugging program.

Using the terminal and the interactive program, David McKensie does program maintenance for a group of older Cobol programs that control shipping and receiving for the company's truck fleet. These programs are constantly being updated, and McKensie uses the program — Application Development Systems, Inc.'s Xpediter — to ensure that program changes work and have not suppressed other functions of the system.

McKensie admitted he is probably slower than most other programmers, but added he is likely to be more thorough. Several special features of Xpediter, he said, give him the ability to move slowly through a program as he traces its logic or examines its source code. Using Xpediter, he can set breakpoints anywhere in a program, and the program will halt and provide specific details, such as source code and data, when it reaches them.

McKensie also noted that he uses another Xpediter feature, a pause control, on just about all of the 13 or 14 programs he tests weekly. He also uses Xpediter's display feature to display source code as it is being written.

That display, of course, is verbal, not visual, but McKensie's talking IBM 3278 terminal uses a voice synthesizer to read the screen's display in either a line-by-line or full-page mode. Though the programs with which he works are older than most, the majority of McKensie's work is now done on-line, using the terminal and Xpediter running on an IBM 3081 mainframe under MVS/TSO.

For testing and maintaining programs, McKensie said he favors Xpediter over IBM's Tivoli, another testing program in use by the firm, for its greater power and ease of use.

Despite his handicap, McKensie is no slouch as a programmer. He knows approximately 12 programming languages — Cobol, assembler and Fortran among them — and has gained both associate's and bachelor's degrees. He eventually plans to gain an MBA as well and ultimately become a data processing administrator.

McKensie credits the success he has had as a programmer to his refusal to "be limited by the way sighted

people do it." He said he talks either blind people entering data processing that "it's not an easy field to master, but for everything that a sighted person does that a blind person can't do, there's a way [for the blind] to do it."

Another of McKensie's "ways" of overcoming blindness involves his dog, Sheba,

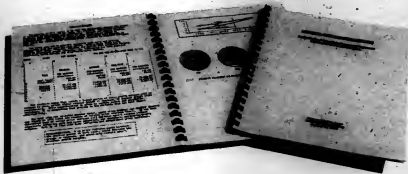
a golden retriever that attended classes with him while he studied for his associate's degree at DeAnza College in Cupertino, Calif. Sheba eventually accompanied him up the aisle at graduation wearing her own cap and gown, compliments of the school's administration.

McKensie also credits Levi

Strauss with creating a supportive environment for blind programmers. The company supplied McKensie with the talking terminal but, he noted, offers the handicapped no demeaning "special treatment." Two blind applications programmers work in another Levi Strauss department, he noted.

McKensie and Sheba

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## NEWS

# Data dictionary steers Amtrak onto right track

WASHINGTON, D.C. — A data dictionary has brought organization and reduced effort to the production of program documentation in National Railroad Passenger Corp.'s Computer Services Department, according to the department's project manager for data administration.

The data dictionary also

provides the firm — better known as Amtrak — with a central point for recording changes in programs and the steps in new routines, project manager Barbara Rohland said. When documentation had been done manually, employee turnover had meant that "experts for undocumented systems were walk-

ing out the door and taking their knowledge with them," Rohland said.

The data dictionary, she explained, shows the relationships between programs, where data is stored and the running instructions involved. It displays its documentation on users' screens — Rohland said printed docu-

mentation would be too voluminous and operates on the department's IBM IMS data base management system, which runs on three IBM 3085 mainframes.

Since its introduction in the rail passenger agency seven years ago, the University Computing Co. UCC-10 Data Dictionary/Manager

has been used to document the programming for several financial and personnel applications programs, including a labor data collection system. That system receives input on Amtrak employees' work hours, absences and overtime from over 100 data entry terminals nationwide.

UCC-10 is also aiding the department's quality assurance program where, according to Rohland, it provides a central place for all the bits and pieces of documentation about a system and is proving helpful for programming impact analysis. "If something is modified," she explained, "we can use the dictionary to determine everything affected by that change. For example, if a data definition or program is to be modified, we can use UCC-10 to determine what users or applications will be affected and must be considered if the change occurs."

## Sees department time

The data dictionary also saves the department time, Rohland said. Its "generator" features create Control I/O areas and IMS control blocks, and its "convert" feature automatically structures existing files and data bases by indicating what file or data base must be built where it is to be taken from and how it is to be structured, she said.

In the future, Rohland said, the documentation provided by the data dictionary will prove useful as the Computer Services Department incorporates Information Builders, Inc.'s Focus, a fourth-generation language that will ease DP for Amtrak's non-DP personnel. Focus will be used by Amtrak departments such as marketing, payroll and finance and will run on IBM 4300 processors and several personal computers, Rohland said.

The UCC-10 data dictionary does not interface with the Focus language, she noted, but will provide Focus users with the locations of the data they are seeking.

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## NEWS

# WP to aid Chinese-English effort

By David Olmos  
CW Staff

AMHERST, Mass. — Computer technology will play a significant role in a cooperative effort by the University of Massachusetts at Amherst (UMass) and China's Peking Institute of Foreign Languages to develop a comprehensive Chinese-English dictionary.

A Chinese-character word processing system donated for the project by the founder of Wang Laboratories, Inc., Dr. An Wang, will be used for gathering and processing data, as well as for possible future revisions of the dictionary. Shou-Hsin Teng, chairman of the Asian studies department at UMass and project director for the dictionary, estimated the dictionary would require double the time and staff if done manually.

As evidence of the magnitude of the undertaking, Teng noted that even with the help of computers, the

project is still expected to take five to six years to complete.

The stage for this joint effort between the U.S. and China was set back in October 1962, when Teng first learned that the Peking Institute planned to update a dictionary published in 1975. He suggested that UMass could aid in the project by supplying computer technology of a kind not yet available in China.

The word processing system will be especially useful in developing several cross-reference indexes that will be required to help English-speaking people find the Chinese words they need. At least five indexes will be needed, Teng said.

"Hopefully, after the first volume is published in five or six years, we will be continuously revising our data base," Teng said.

The Wang donations include two Model 5324-I workstations and a Model

9640-I dot-matrix printer that can produce Chinese ideographs. The Wang system, which will be housed at UMass, contains an 11,000-character memory of Chinese ideographs. The word processor uses an English standard keyboard and can be coded using a system in which three corners of a Chinese character are assigned a two-digit code. The resulting six-digit code is displayed on the monitor and then printed out.

The project is dependent on UMass obtaining a three-year grant of \$600,000 from the National Endowment for the Humanities. If the grant falls through, Teng said that private funding may be sought.

UMass is contributing more than \$220,000 to the project. The Chinese government will support a full-time staff of 20 people in Peking, who will be responsible for collecting raw data for the dictionary.

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McDonnell Douglas Astronautics Company, Box 516, St. Louis, MO 63166.

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## NEWS



**INTERNATIONAL  
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## AUSTRALIA

**CAMPEDOWN** — Computer Accounting Services Pty. Ltd. has placed an order for seven Digital Equipment Corp. VAX-11/750 superminis. One will be used to run a videotex service, and the rest will handle Infoport, the company's on-line information and accounting service.

## BELGIUM

**BRUSSELS** — The European Economic Commission's European Strategic Program for Research and Development in Information Technology (Esprit) project will develop an experimental local-area network system. The European Local Area Network (Elan) initially will be used by Esprit itself, facilitating communication between its various task forces. The research and development contract for Elan has been awarded to a consortium of four leading European information technology companies: Bull, ICL Co., Olivetti and Sted and Siemens AG. Evolving international standards for Open System Interconnection and local-area works will be included in the project.

## BRAZIL

**RIO DE JANEIRO** — During the second meeting of the Computer Software Companies Group, Jose Maria Sobrinho, president of the Brazilian

Association for Information Services Companies, argued for market reservation for the software sector — with certain limitations. He said that such a policy would establish a more equitable environment for competition between national companies and multinational software firms.

## CHINA

**HONG KONG** — Swiss Systems, the microcomputer supplies unit of the Swiss Pacific Group, has appointed an Indonesian distributor, which has signed to buy \$5 million worth of equipment over three years. Significantly, the Indonesians have ordered an equal mix of Victor Business Products, Inc. and Apricot computers. A Swiss spokesman commented, "Two-

ple we talk to are aware of Victor's status, but it hasn't affected sales in the region."

**BEIJING** — A plan to computerize city management here has been made by the Beijing Municipal People's Government. Ten large projects are scheduled for completion by the end of the year. The projects include 18 traffic control stations, eight business management systems in eight hotels and 50 enterprise management systems in large factories.

## JAPAN

**TOKYO** — Nippon Electric Co. Ltd. has unveiled three 32-bit small business computers called Syntac 160/78, 160/88 and 100/88, bringing

the number of NEC's small business systems up to seven. Priced from \$34,398 to \$67,830, the 32-bit processors operate within the vendor's local-area network.

## NEW ZEALAND

**WELLINGTON** — Databank Systems Ltd. has purchased nine Novastop systems from Tandem Nonstop Ltd., the local subsidiary of Tandem Computer, Inc. The systems, valued at approximately \$8 million, are destined for Databank's two regional headquarters and five remote locations in New Zealand. Databank reportedly plans to use the systems for electronic funds transfers (EFT), but no decision has been reached on what EFT software Databank will choose.

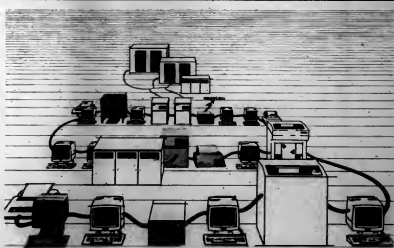
## Siggraph plans July conference

**MINNEAPOLIS** — The Association for Computing Machinery's (ACM) Special Interest Group on Computer Graphics (Siggraph) will hold its 11th Annual Conference on Computer Graphics and Interactive Techniques here July 25-27.

Siggraph '84 will feature sessions on computer graphics research findings, application advancements, technological breakthroughs and industry issues. Presentations are scheduled to focus on ray tracing techniques, modeling, hardware, algorithms, interactive systems, shading and texturing, algorithms for painting and matting and graphics standards. Also, 27 courses on various topics will be offered.

One-day course fees for registrations received before June 15 are \$195 for ACM members and \$225 for nonmembers (\$250 for both after June 15). Two-day fees are \$336 for members and \$366 for nonmembers until June 15 (\$410 after that date). The technical programs are priced at \$195 for members and \$270 for nonmembers before June 15, and \$336 for members and \$366 for nonmembers afterwards.

More information is available from the ACM Siggraph '84 Conference Office, 111 Wacker Drive, Chicago, Ill. 60601.



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## NEWS



CALL FOR  
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**INSTRUMENT SOCIETY  
OF AMERICA (ISA)  
CONFERENCE**  
Boston, May 14-16, 1985

ISA is looking for papers concerning sensors and transducers in process measurement and control; micro-

processors for control and distributed control in computer technology; fiber-optics communications and lasers for measurement in electro-optics; metrology and calibration techniques and standards in test measurement; distributors, product training and digital training for sales engineers in marketing and sales; and data acquisition and telemetry, wind and solar power sources and satellite communications in

marine sciences.

A short summary or abstract of the work should be sent by May 16 to Keith S. Herbst, 1805 Rose Valley Way, Ambler, Pa. 19002.

**INTEGRATED ON-LINE  
LIBRARY SYSTEMS**  
Atlanta, Sept. 13-14

Papers are solicited that address aspects of integrated on-line library systems including selection and evalua-

tion; installation of systems; administrative issues; aspects of multicampus, multi-branch or multitype installations; interfacing; linking systems; local-area networks; integrated data bases; data base conversion; new and emerging systems and interacting subsystems; and other related topics.

The maximum length for papers is 2,500 words. Complete typewritten copies of manuscripts (including illus-

trative material) must be received no later than June 30.

Papers should be submitted to Gensway & Associates, Inc., 530 W. Broadway Circle, P.O. Box 477, Canfield, Ohio 44406.

**1986 OFFICE  
AUTOMATION  
CONFERENCE  
(OAC '86)**  
Atlanta, Feb. 4-6, 1986

Sponsored by the American Federation of Information Processing Societies, Inc., OAC '86 is currently looking for papers on the following tracks: organizational impacts; office workstation; ergonomics of the workplace; communications technologies and issues; productivity and requirements evaluation; and networking applications.

Proposals should outline the possible issues to be presented or discussed at OAC sessions, the names and relevant qualifications of proposed session participants, the selected track and whether the proposal should be evaluated as a track workshop.

Proposals should be two to four typed pages. Three copies of each proposal should be submitted by June 15.

OAC '86 is also sponsoring a paper competition. Papers submitted should represent an application of office automation where major impact has resulted. Five double-spaced copies of papers that do not exceed 15 pages must be submitted by June 15. All papers should be submitted to OAC '86 Program, Dr. Sidney K. Harris, Director, Research and Program Development, Decision Sciences Laboratory, Georgia State University, University Plaza, Atlanta, Ga. 30303.

**CONFERENCE ON  
COMPUTER-AIDED  
TECHNOLOGIES  
(Comapta '86)**  
Montreal, Sept. 5-11, 1986

Sponsored by the Institute of Electrical and Electronics Engineers (IEEE), Comapta '86 is seeking papers on computer-aided design, manufacturing, industrial operations, decision making and office systems; computer-aided education; computer communications; man-machine communications; and advanced software for industrial systems.

The deadline for papers is Oct. 1. Authors should send either a long paper of no more than 6,000 words or a short paper of no more than 2,000 words. Short papers should also include a 200- to 500-word abstract. All papers should be submitted to Comapta '86, P.O. Box 577, Desjardins Postal Station, Montreal, Que., Canada H5B 1B7.



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## NEWS

## CALENDAR

## WEEK OF MAY 13

**MAY 13-17, PROVIDENCE, R.I.** — The Spring 1984 Conference of Honeywell Small/Modem Systems Users. Contact: North American Honeywell Users Association, P.O. Box 2087, Wiltshire, N.J. 08048.  
**MAY 13-17, ANAHEIM, CALIF.** — Computer Graphics 1984. Contact: National Computer Graphics Association, 8401 Arlington Blvd., Fairfax, Va. 22031.  
**MAY 14-15, CHICAGO** — Local Area Networks. Contact: Techtran,

72 Cummings Point Road, Stamford, Conn. 06940.

**MAY 14-15, CHARLOTTE, N.C.** — Vasm OS and DOS Performance and Tuning. Contact: Betty Bruce, Qual Systems International, Inc., 4455 N. High St., Columbus, Ohio 43214.

**MAY 14-15, SAN FRANCISCO** — Data Communications: Effective Network Design. Contact: Datapro Research Corp., 1806 Underwood Blvd., Delran, N.J. 08078.

**MAY 14-16, CHICAGO** — Telecommunications Management: Equipment Planning, Selection and Use. Contact: Datapro Research Corp., 1806 Underwood Blvd., Delran, N.J. 08078.

**MAY 14-16, SAN FRANCISCO** — Strategic Planning for Office Automation. Contact: Technology Trans-

fer Institute, 741 10th St., Santa Monica, Calif. 90402.

**MAY 14-16, SAN FRANCISCO** — Computer Operations: Effective Production Scheduling and Control. Contact: Datapro Research Corp., 1806 Underwood Blvd., Delran, N.J. 08078.

**MAY 14-16, TEANECK, N.J.** — Project Management. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wallingford, Mass. 02181. Also being held May 14-16 in Boston.

**MAY 14-16, SAN FRANCISCO** — Strategic Planning for Office Automation. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

**MAY 14-16, NEW YORK** — Computer Literacy for Accounting and Financial Managers. Contact: Amer-

ican Management Associations, 135 W. 50th St., New York, N.Y. 10020.

**MAY 14-15, HOUSTON** — Data Base Development Workshop. Contact: Elise Sabatini, Lonsdale & Burdett Management Systems, Inc., Suite 406, 2800 N. Loop W., Houston, Texas 77062.

**MAY 14-15, WASHINGTON, D.C.** — Managing the Audit of Computer-Based Systems. Contact: Darlene Pfandling, Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

**MAY 14-15, NEW YORK** — Structured Systems Analysis Workshop. Contact: Elise Sabatini, Lonsdale & Burdett Management Systems, Inc., Suite 406, 2800 N. Loop W., Houston, Texas 77062.

**MAY 14-15, CHICAGO** — Advanced Structured Analysis. Contact: Yordun, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

**MAY 14-15, ENGLEWOOD CLIFFS, N.J.** — Work Load Analysis and Forecasting. Contact: Institute for Software Engineering, 510 Oakland Pkwy., Seneca, Calif. 94096.

**MAY 14-15, WASHINGTON, D.C.** — Information Modeling Workshop. Contact: Yordun, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

**MAY 14-15, NEW YORK** — IBM/DC. Contact: Syssed, One Park Ave., New York, N.Y. 10018.

**MAY 14-15, HOUSTON** — Expert International. Contact: Expertech International, 8th Floor, 2033 M St. N.W., Washington, D.C. 20036.

**MAY 15-16, ATLANTA** — OS Dumps and Debugging. Contact: Advanced Technology Systems, Inc., P.O. Box 6900, Norcross, Ga. 30091.

**MAY 15-16, CHICAGO** — Factory Systems Summit Conference. Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

**MAY 15-17, BOSTON** — Electro '84 High-Technology Electronics Exhibition and Convention. Contact: Electronic Conventions, Inc., 6110 Airport Blvd., Los Angeles, Calif. 90045.

**MAY 15-17, ARLINGTON, VA.** — SAS Basics Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

**MAY 15-18, BIRMINGHAM, ENGLAND** — Communications 1984. Contact: Kallman Associates, 5 Maple Court, Edgewater, N.J. 07640.

**MAY 15-18, KANSAS CITY, MO.** — Structured Systems Design. Contact: Georganna Caron, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

**MAY 15-18, ST. LOUIS** — CHIC Logic and Debugging. Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, St. Louis, Mo. 63180.

**MAY 16-17, NEW YORK** — IBM Directions in Communications, Office Systems and Personal Computers. Contact: Marilyn Chastone, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

**CGA** CGA Software Products Group, Inc.

TO: ALL SINGLE IMAGE SOFTWARE USERS  
 FR: CGA TECHNICAL SUPPORT STAFF  
 RE: MSI ENHANCEMENTS

As many of you started migrating to XA, you discovered that changes were made in VSAM processing in DFP/XA that affect the QNAMES SYSVSAM and SYSIGV2. These changes have resulted in a need for DFP to be run on all machines—XA and non-XA—in order to maintain a single image link between them.

Seeking a solution to this cumbersome and possibly expensive process, many users called our technical support staff for suggestions.

The result has been Super-MSI V7.3. This interim release supports sharing of these VSAM QNAMES between DFP and non-DFP systems through the MSI option DFFCMPAT. Rental of DFP/370 for non-XA 308X and 43XX machines as well as all 308X machines is no longer required to achieve compatibility!

Regardless of your XA migration schedule, this feature of Super-MSI V7.3 will be a useful and cost-saving aid. But, this is not the only enhancement we have to announce. In addition, V7.3 includes our first in a series of enhancements that will make SIS more flexible and easier to use...

**OUR CLIENTS WOULDN'T EXPECT ANYTHING LESS.**





## NEWS

**MAY 16-17, GREENBELT, MD.** — Relational Data Base Systems. Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

**MAY 16-17, COLLEGE PARK, MD.** — Programming in Basic. Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

**MAY 17, ATLANTA** — DBMS II. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

**MAY 17-18, NATICK, MASS.** — Systems Design. Contact: Kathy Shaw, Office of Continuing Education, Higgins House, Worcester Polytechnic Institute, Worcester, Mass. 01609.

**MAY 17-18, ORLANDO, FLA.** — DBMS System Generation and Tuning. Contact: Harris Education Center, 1035 W. Nasa Blvd., Melbourne, Fla. 32919.

**MAY 17-18, ATLANTA** — Computer Networks: Protocols, Standards and Compatibility. Contact: Datapro Research Corp., 1806 Underwood Blvd., Deiran, N.J. 08078.

**MAY 17-18, COSTA MESA, CALIF.** — System Productivity Facility Design. Contact: Software Intelligence of America, P.O. Box 1380, Spring Valley, Calif. 95077.

**MAY 18, SEATTLE** — Hands-On Unix. Contact: Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

## WEEK OF MAY 20

**MAY 20-22, ANDOVER, MASS.** — Advances in Office Automation. Contact: Institute for Graphic Communication, 376 Commonwealth Ave., Boston, Mass. 02115.

**MAY 20-23, FORT LAUDERDALE, FLA.** — Harris Users Exchange 1984 Symposium and Annual Meeting. Contact: Gary Chapman, Harris Corp., Computer Systems Division, 2102 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

**MAY 21-22, NEW YORK** — Data Communications II. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

**MAY 21-22, SAN FRANCISCO** — Database Network Design and Planning. Contact: Probe Research, Inc., P.O. Box 500, Morristown, N.J. 07960.

**MAY 21-22, DENVER** — ADP Project Management in Government. Contact: U.S. Professional Development Institute, Department AR, 1620 Elton Road, Silver Spring, Md. 20903.

**MAY 21-22, SAN FRANCISCO** — Electronic Financial Services. Contact: Law & Business, Inc., 757 Third Ave., New York, N.Y. 10017.

**MAY 21-22, NEW YORK** — Evaluating Decision Support Software. Contact: Donna A. Kacin, Research & Planning, Inc., 218 First St., Cambridge, Mass. 02142.

**MAY 21-23, SAN FRANCISCO** — Microcomputer Data Base Management Systems. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

**MAY 21-23, CARY, N.C.** — SAS Principles of Regression Analysis Course. Contact: SAS Institute, Inc., P.O. Box 9000, Cary, N.C. 27511.

**MAY 21-24, PHILADELPHIA** — Structured Programming. Contact: QED Information Sciences, Inc., QED

Plans, P.O. Box 181, Wellesley, Mass. 02181.

**MAY 21-24, TEL AVIV** — Israeli Tech 1984. Contact: Peter Moshirad, Israel Trade Center, 905 Fifth Ave., New York, N.Y. 10118.

**MAY 21-25, SAN FRANCISCO** — Advanced Structured Analysis. Contact: Youdon, Inc., 1125 Ave. of the Americas, New York, N.Y. 10036.

**MAY 21-25, NEW YORK** — CROS Command-Level Programming. Contact: Syzed, One Park Ave., New York, N.Y. 10016.

**MAY 21-25, BOSTON** — Systems Design. Contact: QED Information Sciences, Inc., QED Plans, P.O. Box 181, Wellesley, Mass. 02181.

**MAY 21-25, CHICAGO** — Vana. Contact: Syzed, One Park Ave., New York, N.Y. 10016.

**MAY 21-25, LOS ANGELES** —

Project Planning and Control Workshop. Contact: Youdon, Inc., 1125 Ave. of the Americas, New York, N.Y. 10036.

**MAY 21-25, JERUSALEM** — The Fourth Annual Jerusalem Conference on Information Technology. Contact: New England-Israel Chamber of Commerce, Inc., 471 Butler Office Building, Boston, Mass. 02114.

**MAY 21-25, WASHINGTON, D.C.** — System Resources Planning Selection. Contact: Institute for Software Engineering, 510 Oakwood Pkwy., Sunnyvale, Calif. 94088.

**MAY 21-25, DALLAS** — Information Modeling Workshop. Contact: Youdon, Inc., 1125 Ave. of the Americas, New York, N.Y. 10036.

**MAY 21-25, NEW YORK** — Structured Analysis and System Specification Workshop. Contact:

Youdon, Inc., 1125 Ave. of the Americas, New York, N.Y. 10036.

**MAY 23-24, BOSTON** — SAS Business Course. Contact: SAS Institute, Inc., P.O. Box 9000, Cary, N.C. 27511.

**MAY 23-24, SAN MATRIO, CALIF.** — Seminars/Work '84. Contact: Mathews & Clark Communications, 410 Cambridge Ave., Palo Alto, Calif. 94304.

**MAY 23-24, DENVER** — Focus on Data. Contact: DataStat Statistical Seminars, Room X-60236, Wilmington, Del. 19886.

**MAY 23-26, PAKES** — BE Group. Contact: Syzed, 2944 Sixth St., Berkeley, Calif. 94710.

**MAY 23-26, SPOUL, SOUTH KOREA** — Offcomp Korea '84. Contact: Clapp & Polish International, P.O. Box 70067, Washington, D.C. 20085.

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# VIEWPOINT

## Avoid 'quick-fix' techniques



THE DATA  
SOURCE  
John P. Murray

Some of us in the MIS profession believe in the use of a structured approach to the development of large-scale systems and in the process used to make significant changes to existing operational systems. We have learned that unless we persevere and do the required preliminary work — that is, the investigation and analysis — and unless adequate care is taken throughout the development/implementation process, the final result of the project will usually be considerably less than satisfactory.

The advent and proliferation of microprocessors, the introduction of information centers and the use of fourth-generation programming languages in the client areas have not only provided the opportunity to move many of the more mundane aspects of information processing out to the client areas, they have also brought about in the minds of some senior-level managers a perception that a great deal of the MIS effort can be carried on in a much more immediate, "quick-fix" mode.

The ease with which much of this routine work can be accomplished by people with very limited information processing experience or training in an MIS environment where the processes have been correctly installed helps to change the organization's information processing climate.

Given the relative ease with which these people can obtain answers, it seems logical to those looking in from outside that in an MIS environment where the proper interactive tools (the information center and the effective use of a fourth-generation programming language) have been provided, much of the detail and control work of the structured approach becomes unnecessary.

The result of such a superficial conclusion, particularly where the MIS clients have realized some success on their own, is to mount a campaign to cir-

***MIS has a responsibility . . . to do whatever is required to build and maintain a stable operating environment. . . . Wherever the push to move to a quick-fix effort jeopardizes the stability of the MIS operating environment, that effort must be resisted.***

cumvent the MIS bureaucracy. In this situation, MIS will see a growing effort to forget about the "unnecessary overhead" of the structured approach and to push ahead to get the job done.

There is some validity in adopting such a position. The changed MIS environment that is a result of the effective delivery of the appropriate interactive processing tools does lend itself, for a given type of work, to more free, more immediate MIS methods. A critical factor in the identification of projects that fit more immediate methods.

### Victims of success

To a great extent, the MIS department that has done its job and achieved its goal of providing a truly effective interactive processing environment becomes a victim of that success. Aggressive clients will push hard to get their own way. In this environment, MIS management must continue to encourage clients in the pursuit of their particular goals where practical, yet at the same retain proper control within the realm of large-scale projects.

In such a circumstance, there is, more than ever, a real need for the MIS department to fight to maintain appropriate control for those areas in which it has ultimate responsibility. In certain situations, for instance, where the client is doing his own work with relatively simple systems and non-complex programming, there may be room for some degree of carelessness. This is not the case

with large MIS projects, whether they are new systems or enhancements to existing systems or purchased or developed in-house.

Pressure to provide more faster is certain to mount on all MIS installations. With the use of fourth-generation programming languages, it is possible to be more responsive and to produce more; but the reduction in the coding and testing time that can be accomplished through the use of fourth-generation programming languages should not be confused (although that is what happens as success is achieved with interactive processing) with any need that is less critical to the rest of the job, that is, the design, the development (or in the case of the purchased software package, the investigation), the testing and implementation of the product. These pressures to move to a quick-fix environment must be resisted.

As we work hard to become increasingly responsive to our clients, to allow the clients to manage their particular information processing needs more easily, we will find that we have to begin resisting the pressure to weaken our proven techniques.

Clearly, MIS has a responsibility to the organization to do whatever is required to build and maintain a stable operating environment. A balance must be struck between the need to accommodate the desires of the MIS clients and to protect the organization. Wherever the push to move to a quick-fix effort jeopardizes the stability of the MIS operating environment, that effort must be resisted as vigorously as possible by MIS. It is not easy; it will tend to irritate the clients and senior management, but it is right and it must be done.

The line between MIS control and chaos is, as many organizations have found much to their sorrow, very thin indeed. The inappropriate adoption of quick-fix techniques can very easily push the organization over the line from control to chaos.

*Murray is director of management information services for Raytheon Corp., Madison, Wis., and a co-author of Management Information Systems, an Corporate Resource, published by Dow Jones-Irwin.*

## Are DP managers fighting micro acceptance?



HUMAN  
CONNECTION  
Jack Stone

In the article "Micro user sets record straight" (CW, March 19), I presented the epitome of Richard W. Hadley, vice-president for operations at Mount Auburn Savings Bank, Mount Auburn, Ind. There he says that "MIS types . . . apparently stupidly ignoring microcomputers and the past six or seven years, hoping they would go away, now [are] being dragged, kicking and screaming, into the real world by the users."

Surely you've all heard similar comments proffered by sundry segments of the user population. But if you are one of us long-timers in the DP management field, this wearisome charge is old hat.

History is repeating itself, and only the name of the technology game has changed. We've heard the same hackneyed remarks when intelligent terminals showed up, when remote batch kludges were installed and way back when the first TTY time-sharing systems came on-line.

### 'Go slowly, very slowly'

I lean toward the view that the vast majority of MIS managers know full well how to respond when large masses of users become all hot and bothered about some new shiny machine. And that response is, and should be, to my thinking, "Go slowly, very slowly, and go according to a carefully researched corporatewide information systems plan."

***The vast majority of MIS managers know full well how to respond when large masses of users become all hot and bothered about some new shiny machine. . . . 'Go slowly, very slowly, and go according to a carefully researched corporatewide information systems plan.'***

In other words, I believe that DPers plan and control microcomputer introduction in an intelligent, balanced way, or at least they attempt to do so within the confines of a corporate policy that may be so liberal as to give the users whatever they want.

Haven't we all learned by now that the thrills enjoyed by many users for fondling new terminal or personal computer systems must be subordinated to irrefutable insurance that the introduction of such machines — micro-based, mini-based or maxi-based machines — will be properly controlled?

That means that systems will, in fact, be visible. Software not only has the documented functionality, but it actually does run the way it's supposed to. It's not only the case that users are trained to push a bunch of keys to obtain the results they're after, but that they also have some notion as to

what is really going on.

### Anticipate increased work loads

Mainframe operators have been made aware of new shipments of terminal devices to the departments, so they can anticipate increased work loads. System analysts are readied for the inundation of requests for user support. User stations are not only accessible, but they are truly operated on other than a casual basis.

May I remind the oft-stated, though often unheeded, lament that uncontrolled proliferation is anathema in the DP arena? It is equivalent to squandering preciously needed equipment dollars, to diverting the energies of talented DPers to low-priority applications and to diverting DP management's attention from more critical areas.

But it is possible that neither my thoughts nor Hadley's reflect the real "real world." Maybe he's way out in left field, and I'm far out in right. In these matters, there often is middle ground. Surely, there are some DPers who work mainly with micro users who fit into the major data bases, only setting guidelines and offering some support for others.

There are others who are too busy with mainframe issues to support micro users who belong to the most influential users or those who yell the loudest. And I suppose there could always find the radical few who, as Hadley states, are "stupidly ignoring micro . . . hoping they would go away" — but I don't believe it would be easy to do.

*Letters to Stone should be addressed to him at P.O. Box 35629, Washington, D.C. 20035.*

## VIEWPOINT

# Hiring success depends on heeding fundamental rules



**READER'S  
PLATFORM**  
Thomas J. Hulon

Recruiting the quality candidate that a corporation requires is needlessly complicated by ignoring some very fundamental rules. By fol-

lowing them, the time, effort and expense of the recruiting process can be greatly reduced.

The success of the end product — the person hired — can be greatly improved by following these rules:

■ **Define the job.** Too often, the job to be done is either never defined or is final-

ized as the last step in the recruiting process. The reason for this is simple: Positions are not viewed in the abstract, but in conjunction with the person filling them. We think in terms of replacing Harry or hiring another Mary rather than specifying exactly what needs to be done and what would be nice

to have done. Since we never find another Harry or Mary, the hiring manager is either frustrated, because "the perfect candidate" never appears, or dissatisfied, because the person finally hired is a compromise.

The job definition needs to consist of what activities must take place (the job de-

scription); what the results must be (the standard of performance); and the desirable, but not necessary, auxiliary functions (to choose between two or more candidates who meet all the basic requirements).

■ **Define the candidate's attributes.** What characteristics must a person have to perform the functions of the job? This seems rather obvious, but too often managers focus on characteristics they would like a candidate to have as a person (bravery, honesty, a sense of justice and so on) rather than the characteristics a candidate must have to do the job (the ability to program in Cobol, the ability to sell integrated circuits to a consumer products company, the ability to audit financial reports and so on).

Is it, for example, necessary that a candidate have an advanced degree? If so, why? Is it necessary that a candidate have X number of years of experience performing an activity, or is it important only to have the ability to perform an activity?

The more confusion that exists surrounding necessary attributes, the less candidates will qualify and the more difficult it will be to identify the person most qualified to do the job in question.

■ **Be realistic about compensation.** Notwithstanding the salary ranges of the personnel department and the budgets of accounting, the real world functions on a competitive, open market basis. Far too often, a salary range is established for a position that is inadequate to attract the caliber of person required. This leads to frustrated interviews, rejected job offers and either the hiring of a candidate without the necessary qualifications or an increase in the starting salary and a new round of interviews.

Some of the reasons for unrealistic salary offers are: A departing employee was paid a below-market salary, and the new salary is predicated on the old; the personnel department supplies survey information based on averages, and the person required is not an average person or the position is not an average position; the accounting or finance department establishes the salary range with the objective of holding down costs; and a salary range is hypothesized based upon newspaper ads.

This problem is solved by letting the marketplace do

See ME11 page 42

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Hulon is a senior associate at Korn/Ferry International in Palo Alto, Calif.

# OF THE BIG THREE IN BUSINESS SOFTWARE TODAY, WHO'LL BE ON TOP TOMORROW?



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# SOFTWARE & SERVICES



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## College mastering real-world MIS

**B**usiness schools have long been laboring under the stigma that they are not in step with the real business world. Particularly in MIS, the institutions have been criticized for reflecting the reality of 10 years ago, when programmers were king of the information castle, rather than mirroring the data-rich environment of the modern corporation.

The recently created Master of Science in MIS program at Boston University's School of Management is now trying to tackle that issue, particularly as it relates to the integration of microcomputers and mainframes. The school is developing a series of case studies that use the micro as the primary tool for analyzing business problems encompassing large amounts of data. The Educational Materials Development Project will initially consist of eight case studies, which will be fully integrated into BU's MBA program in the spring of 1985.

The novel aspect of the project is its emphasis on using the micro to tie in to the corporate data base rather than just as a glorified calculator. According to Michael E. Lawson, director of the master's in MIS program, "Problems now being solved on micros are minuscule compared to the size of real problems. Students have to learn to deal with a lot of data, possibly being elsewhere," he said.

The case studies, which are being developed by BU management faculty in concert with MIS faculty, will be offered in a variety of courses for both MIS and non-MIS students. All cases are based on real-life experiences garnered from interviews with corporations. Students will be given case data that replicates what might be found in a corporate data base and, in some cases, will have access to sample data bases on BU's IBM 3081 mainframe. A room containing 20 to 25

See MBA page 52

## Nuclear staff eyes integration Prototyping key to large development project

By Paul Gilks  
CW Staff

SEABROOK, N.H. — What do you do when you are faced with a monstrous application development project, no other models on which to base it and a set of regulatory and user requirements that change almost daily?

Go with a system development methodology, write in a high-level language and prototype, prototype, prototype. That's the solution the Public Service Co. of New Hampshire (PSNH) is pursuing to build what it believes is the country's largest integrated nuclear information system.

The Fully Integrated Nuclear Information System (FINIS) project will automate virtually all station operations at the Seabrook nuclear power plant here, which is scheduled for completion in early 1986.

FINIS is designed at least in part with the intention of avoiding the information problems that contributed to the near-disaster at the Three Mile Island nuclear power plant in Harrisburg, Pa., five years ago, developers admitted. Lack of systems integration and a reluctance to share data were blamed in part for that accident.

The key was that whatever system we used would have to be integrative, not just interface," said Eric Speed, data base administrator in the Nuclear Information System Group. "The bottom line is that if

something goes wrong with the plant, we have to fix it as quickly and efficiently as possible."

After evaluating and rejecting several packaged applications, PSNH elected to build FINIS from scratch using its Cullinet Software, Inc. DBMS data base management system (DBMS), Cullinet's ADP/On-Line and Infodata Systems, Inc.'s Inquire high-level language and DBMS. When completed in early 1986 at a cost of over \$6 million, FINIS will incorporate six major integrated systems — including materials, work requests, radiation work permit, personnel, systems and components and document control — and 23 subsystems.

It is expected to include 360 DBMS record types, track 48,000 parts and keep records on up to 4,000 modules, Speed said. FINIS will also be tied into selected applications at corporate headquarters in Manchester, N.H.

The need for integration is driven by stringent regulatory requirements and concern for safety, Speed explained. "We have to be able to track every installed piece of equipment from womb to tomb," he said. "We want the maintenance engineer to be able to hit a PF [programmed function] key and find the parts he needs, his another PF key and find out if they're available, and if not, find out if they're on

See PSNH page 52

## Controversy lowers project morale

SEABROOK, N.H. — The construction site of the two nuclear reactors at Seabrook Station here is a virtual oasis of calm compared to the storm that is swirling around Public Service Co. of New Hampshire (PSNH), the utility that is building the reactors. Plagued by cost overruns and delays, PSNH has suspended construction of the second reactor at Seabrook and is seeking rate increases in a last-ditch effort to keep the company solvent. Seabrook has also been the target of numerous antinuclear protests since construction began in 1976.

All this has not directly affected work on the Fully Integrated Nuclear Information System (FINIS) within the on-site DP

group at Seabrook. Developers say Seabrook 1 is almost certain to be completed, if not by PSNH, then by whichever investors buy the plant. But with a slowdown in hiring in effect and an uncertain future for Seabrook, morale is a problem.

"It can get depressing with all the controversy," said Richard Bonal, FINIS project manager. "I have to keep emphasizing the positive things to keep the morale high."

Bonal said the contention surrounding nuclear power has not had a major effect on hiring. However, others noted that PSNH's financial insecurity has taken its toll. "It's tough to make long-term plans here," one employee said.

## !Candle

Candle Corp. has announced a version of its EpiLog performance management system for IMS/44



Computer Associates International, Inc. released an enhanced version of CA-Universe/44

Softool Corp. offers a set of integrated programming tools/44

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## Info Builders adds window-driven natural language interface

NEW YORK — Information Builders, Inc. has added a window-driven natural language interface to the new release of PC/Focus, the microcomputer implementation of its mainframe Focus package.

Release 1.0 of PC/Focus features TabSheet, an interface that enables users to develop report requests without typing, and that visually assists the user through a series of static and "pop-up" screen windows that cover all phases of preparing a report request.

The enhanced version also offers Link, described as a micro-to-mainframe communication facility that enables bidirectional data transfer between PC/Focus and mainframe Focus. Link is said to support both asynchronous and IBM 3270 bi-synchronous Systems Network Architecture and Synchronous Data Link Control operation na-

ing Technical Analysis Corp.'s Irma card.

Users can download information from mainframe files, including Focus, IBM's DB2, Vaux, Ques and DL/I. Access to mainframe data repositories is protected by Focus security, which provides password protection down to the value-within-field level.

The spokesman said data downloaded to PC/Focus can also be written automatically to software Artia, Inc.'s Data Interchange Format for use with other micro software packages. PC/Focus requires a 512K-byte or larger IBM Personal Computer, Wang Laboratories, Inc. or Tera Instruments, Inc. microcomputer with a minimum 512K-byte hard disk.

Release 1.0 of PC/Focus is priced at \$1,800 for a single copy from Information Builders, 1260 Broadway, New York, N.Y. 10001.



TabSheet screen for PC/Focus

## SOFTWARE &amp; SERVICES

# CA-Universe release boasts 35% more I/O performance

**JERICHO, N.Y.**—Computer Associates International, Inc. has announced Release 2.0 of its CA-Universe relational data base management system (DBMS) for use with IBM's DOS/VSE, MVS and VM/CMS operating systems.

According to a spokesman, the enhanced relational DBMS features an automatic forms/screen generator, up to 35% improvement in I/O

performance, screen chaining capabilities and multilane data entry, single-screen/multirelation updating and improved sort speed.

The automatic forms/screen generator is said to enable users to generate screens from existing relations by simply supplying the appropriate data base and relation name.

It also allows immediate querying, retrieval, updating and reporting

without screen or form development, according to the vendor spokesman.

Other enhancements reportedly include an extended program-embeddable interface that allows users with high-level programs to access data contained in the data base's relations, forms security that enables the data base administrator to limit access or define who can generate or

modify screens and improved updating of indexed relations with a high-performance indexing method for mass insertion updates.

Release 2.0 of CA-Universe is priced at \$110,000 for DOS/VSE and \$140,000 for MVS and VM/CMS installations.

Computer Associates is located at 120 Jericho Turnpike, Jericho, N.Y. 11753.

## Candle's Epilog supports IMS

**LOS ANGELES**—Candle Corp. has announced a version of its Epilog performance management system for IBM's IMS data base management system.

Epilog/IMS reportedly permits change evaluation, retrospective problem solving, application system performance analysis and performance reporting. Epilog/IMS is also said to be able to monitor key system performance data, such as message format pool activity, data base buffer pool activity and paging rates.

An automatic analysis feature reportedly selects time periods when IMS service levels are impacted, shows the sources of degradation and

displays the resource information relevant to the major source of degradation. The system performance navigator facilitates interactive exploration of IMS service levels and specifies degradation causes.

According to the vendor, the product can tell when IMS response objectives have been exceeded, what actual service levels are.

Epilog/IMS operates with IMS 1.1.6 and later releases in IBM's MVS/SP 1.3.1 and later MVS environments. It will be priced around \$20,000 with availability in the third quarter of this year. Candle is located at Suite 2404, 10800 Wilshire Blvd., Los Angeles, Calif. 90024.

## Softool offers integrated tools

**GOLETA, Calif.**—Softool Corp. has announced the Softool Programming Environment, which is described as a set of integrated tools for the management, development, testing and maintenance of software systems.

According to a spokesman, the system's man-driven user interface can match the output from one component tool of the integrated environment to the next tool and run tools in sequence without human intervention. The commands simplify program checkout and quality assurance, prototype development and program standard setting.

The tools available with the Programming Environment include a standards and portability auditor, libraries of reusable code, tracing and

testing facilities, performance optimization aids, source code and interface documents and structured programming languages. The system is available through Digital Equipment Corp.'s External Application Software Library or directly from Softool.

The Programming Environment runs on DEC's VAX-11 processors under VMS or Unix; IBM 360, 370, 30 and 4500 series processors under VM/CMS and MVS; Honeywell, Inc. Level 66 and DP68 processors under the firm's Goss; Hewlett-Packard Co. HP 3000 systems under Unix and Data General Corp.'s Eclipse MV series. Prices range from \$10,000 to \$60,000, depending on hardware.

Softool is located at 340 S. Kellogg Ave., Goleta, Calif. 93117.

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## SOFTWARE &amp; SERVICES

## SYSTEMS SOFTWARE

WESTINGHOUSE  
ELECTRIC CORP.  
Virtue

Westinghouse Electric Corp. has announced a systems software package that reportedly provides rapid switching of a CRT terminal between computers in an IBM virtual machine environment.

Virtue is said to support virtual machine consoles in a data processing operation. A single stroke of a user-assigned program function key on an IBM 3270-type CRT terminal switches from a currently running job to any other operational virtual machine console, the vendor said. Autohold and autoenter features of Virtue monitor the ongoing activity of all virtual machine consoles from which the user has switched.

The system also features a mobile alarm that signals the terminal user that a previously switched-off console screen has been altered, requires data entry or has its buffer area filled and requires attention. Console assignments may be added or deleted dynamically.

The Virtue package leases for \$4,000/year, and a monthly license plan is also available.

Westinghouse Electric, Advanced Systems Technology, 777 Ross Center Blvd., Pittsburgh, Pa. 15265.

INTERACTIVE SYSTEMS, INC.  
Scope enhancement

Interactive Systems, Inc. has announced an enhanced version of its Scope forms management system for Digital Equipment Corp.'s VAX-11 superminicomputers.

A spokesman said the new release incorporates an improved user interface, more flexible programmer calls and increased functionality for the Scope forms editor. The system can handle multiple forms per screen, and it allows for the underlining or boxing of fields to enhance the appearance of the screen.

Intrafield editing has been added so that a user may change selected characters in a field without altering the remainder of the data, a spokesman said. The enhanced version also features the ability to create a table of values for the validation of entered data.

The Scope editor provides a cut-and-paste capability that enables the user to create and modify forms easily. Programs written with this version of Scope may be run in batch mode with no special modifications. The Scope software licenses for \$8,500.

Interactive Systems, 131 Middlesex Tech., Burlington, Mass. 01803.

GENERAL ELECTRONICS, INC.  
Colabert Release 6

General Electronics, Inc. has announced Release 6 of Colabert, a Cobol precompiler for IBM mainframes.

The package is designed to make original programming, maintenance and standards enforcement easier. It can use as input any existing or new programs with or without abbreviations and can completely resequence and realign the program for easier reading and modification, the vendor said.

Colabert will add or renumber paragraph names and change all ref-

erences to them in one pass, the vendor said. It can accept user-supplied replacement strings, reportedly making migration to a data base and data dictionary easier. The vendor said that Release 6 also changes the user replacement table area to be dynamically allocated, eliminating the previous limit on the number of replacements that can be made in one pass.

The vendor said that while the system is designed for IBM mainframe Cobol source code, it will also process Cobol programs written for other compilers and can aid in the conversion to IBM systems. It is available for use under any IBM mainframe operating system.

Release 6 is leased for \$40/mo. A three-year lease costs \$1,500.

General Electronics, P.O. Box 79, Lyons, Ill. 60554.

PROGRAMMING  
CONCEPTS, INC.  
Anar

Programming Concepts, Inc. has announced Anar, a programming product designed to allow the development and maintenance of Intel Corp. 8088-based microprocessor software on Digital Equipment Corp. superminicomputer systems.

Anar is said to allow the transfer of files between the formatted single-density 8-in. diskettes and DEC systems. Files may be transferred in either direction, with the required format conversions applied automatically, the company noted. Included with Anar is a Fortran IV subroutine library that gives programmers the ability to access 8088 diskette files directly.

Anar is available for \$700 plus media charges in executable format and for \$1,850 plus media charges in source-code format.  
Programming Concepts, 40 Greenville Drive, Bohemia, N.Y. 11716.

CHAKRA SYSTEMS  
INTERNATIONAL LTD.  
IBM System/36 software

Chakra Systems International Ltd. has introduced a software program for the IBM System/36 computer that reportedly permits the selection and analysis of records in a logical file based on variable values.

The Change Access Path command is able to accomplish this by changing multiple select/omit criteria in the data description specifications.

Continued on page 48

## While you're waiting to see Cullinet's micro to mainframe link, these smart companies are benefiting from ours.

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Mutual of Omaha Insurance Co.    North American Life & Casualty  
Ohio Casualty Group    Research Foundation State University of New York  
Royal Insurance Co. of Canada    St. Paul Companies, Inc.    State of Louisiana  
University of Texas Health Science Center    Warner Brothers    Washington Trust Bank

No access to mainframe link is worth waiting for. The immediate rewards are too great. That's why companies in all areas of business are choosing the OMNILINK™ family of micro to mainframe software from On-Line Software International.

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Preserves mainframe file integrity.

Utilizing OMNILINK's data dictionary, the DP department can define what information is available, to whom and under what circumstances. The data dictionary prevents PC user access to mainframe files from becoming a free-for-all.

Given you an instant PC network.

Besides uploading and downloading mainframe files, OMNILINK file transfer software allows you route file transfers from PCs. But of all, you're not locked into local area networking. You can go as far as your CGS network will take you.

Links all your "other" computer hardware.

OMNILINK's Electronic Mail/Document Exchange component also gives you the option of tying all your IBM/PCs, Wang® word processors, 3270 terminals, teletype terminals, printers, mainframes and even other computer applications into a comprehensive CGS communications network. You can send messages, documents, graphs and spreadsheets to and from any point in your system.

A "generic" micro to mainframe link.

OMNILINK does not lock you into any vendor's mainframe or micro software. You can use the applications you presently run on your system.

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## SOFTWARE &amp; SERVICES

Continued from page 46

and reconfiguring the logical file, a vendor spokeswoman said.

Instead of having high-level language programs read and reject records, the rejection is done by the data base management system at the machine interface level.

The software is priced at \$300. Chabira Systems, 8445 Victoria Drive, Vancouver, B.C., Canada V5P 4A5.

APPLICATION  
PACKAGES

FISCHER-DONIS SYSTEMS CORP.  
Buck

Fischer-Donis Systems Corp. has

announced the Electronic Mail Communications Center System (Emcc), designed to operate in either IBM's CME, TBO or CICS environments.

According to a spokeswoman, Emcc enables users to write and send messages without using a screen editor program. Full screen menus reportedly prevent the system options, and electronic "in baskets" and "out baskets" hold incoming and outgoing mail. Senders receive notification when their letters have been delivered and read.

Users can set up electronic file folders to organize their mail, the spokeswoman said. Emcc is available on a monthly lease program for \$600 for IBM's OS operating system and \$400 for the DOS operating system.

Fischer-Donis Systems, 1175 Merchandise Ave., Naples, Fla. 33942.

SUPEREX BUSINESS  
SOFTWARE  
Energy Accountant

Superex Business Software (SBS) has announced a package that tracks energy conservation efforts and operates on IBM Personal Computers or compatible systems.

The Energy Accountant reportedly takes two to five minutes of work to enter and produce reports. It accommodates any fuel sources; normalizes for weather, facility size and changes in energy systems; prorates fuel and utility bills to monthly consumption; develops energy targets based on past performance; and can handle up to 75 buildings on floppy disk and 300 buildings on hard disk.

Priced at \$1,000, the system includes a variety of management re-

ports and problem-solving features. SBS, 161 Ludlow St., Yonkers, N.Y. 10705.

INFORMATICS GENERAL CORP.  
PVS

Informatics General Corp. has introduced the Production V System (PVS), a comprehensive net-change manufacturing resource planning software system for IBM mainframe computers.

Designed for the IBM 4800 and 30 series mainframe computers running IBM's CICS and DL/I or DB2, the system coordinates the diverse aspects of production and inventory management to help manufacturers produce products on schedule, the company said.

The price ranges from \$11,000 for a single module to \$150,000 for the complete system.

Informatics General, Suite 501, 701 Lee St., Des Moines, IA 50316.

ROSS SYSTEMS, INC.  
Maps/AP

Ross Systems, Inc. has introduced an interactive accounts payable package with cash management features for use on the Digital Equipment Corp. VAX-11 series of mini-computers.

The product, Maps/AP, reportedly provides payables processing, check writing, vendor information, cash management, inquiries, and reports. Maps/AP also is said to provide automatic allocations by vendor and a vendor directory that is available at all times. It can be used as a complement to Maps/GL, the firm's general ledger/financial management package, the vendor said.

Maps/AP's multiple expense distribution previews reportedly allow users to view transactions grouped by unlimited combinations of the various levels of the general ledger account structure.

Maps/AP will be available this spring for between \$15,000 and \$20,000, depending on the DEC VAX-11 series model.

Ross Systems, 1860 Embury Road, Palo Alto, Calif. 94303.

ACM SOFTWARE, INC.  
Manufacturing software modules

ACM Software, Inc. has announced a package of manufacturing software modules for the IBM System/34 and System/36. The seven modules are written in RPG-III and share a common data base.

The Engineering Data Base module provides a bill of materials and routings. The Capacity Requirement Planning module gives long-range manpower and machine requirements. The Formal Purchase Order System module provides vendor analysis, quote processing and recording of purchase orders.

The Master Production Schedule and Material Requirement Planning module reportedly provides production forecasts and customer backlog reports and determines what materials are needed for production and the quantity and location at which they will be needed.

The Inprocess Data Base module provides orders to the shop floor, shop floor control and inventory control. The Job Inventory Costing module produces reports on actual costs. The Standard Product Costing module records cost information, accord-



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really sells for \$1595.

## SOFTWARE &amp; SERVICES

ing to the vendor.

Prices for the seven modules range from \$1,500 to \$4,500. A package price is available for between \$30,000 and \$55,000, depending on modules licensed.

ACSI Software, Suite 402, 2091 W. Big Beaver Road, Troy, Mich. 48064.

#### INTEGRATED TECHNOLOGIES, INC. Soft-Switch Document Control System enhancement

Integrated Technologies, Inc. has announced expansion of its Soft-Switch Document Control System to include support for IBM's Professional Office Support System (Profs).

The interface to Soft-Switch for the Profs user is integrated with the standard Profs mail system. Users of Soft-Switch-supported systems can send reusable form documents to Profs users with standard Soft-Switch commands, the vendor said. These documents will appear in the Profs user's mailbox.

All translation is done through IBM's Level 3 Document Content Architecture. The price for the Profs module is \$10,000. The price for the Soft-Switch system ranges from \$30,000 to \$60,000.

Integrated Technologies, 300 N. Warner Road, King of Prussia, Pa. 19406.

#### VERSATEC CO. DG version of Versaplot

Versatec Co. has announced that its Versaplot Color Random electrostatic plotting software is available for Data General Corp. processors under DG's AOS/VS Fortran 77 operating systems.

According to a spokesman, the DG version provides for plotting of eight line colors and 256 predefined area colors, as well as black and white plotting. Pen attributes, such as dash pattern and pen width, are also user-definable.

The Versaplot Color Random software for the DG AOS/VS operating systems consists of Fortran 77 and macro assembler source code. Command files enable the user to compile and assemble source code and build libraries. The package costs \$4,000.

Versatec, 3710 Wilshire Ave., Santa Clara, Calif. 95051.

#### EVALUATION AND PLANNING SYSTEMS, INC. Micro PCS on DEC Rainbow

Evaluation and Planning Systems, Inc. (EPS) has announced that its Micro PCS Decision Support System is now available for the Digital Equipment Corp. Rainbow personal computer.

Said to be syntax-compatible with the PCS-EP8 version of the decision support system on DEC VAX-11 systems, Micro PCS allows users to create a model on the personal computer, upload it to the mainframe or mini and execute the application on the larger system without program changes, according to a spokesman for the company.

Data may also be transferred downline from mainframes and minis to Micro PCS, the spokesman said.

The software is priced at \$5,000 for a single copy, and quantity discounts are available, the company said.

EPS, One Industrial Drive, Wingham, N.H. 03067.

#### AQUIDOCK DATA CORP. Word-to-Word

Aquidock Data Corp. has introduced Word-to-Word, a word processing conversion utility for the Digital Equipment Corp. line of computers.

Word-to-Word is said to provide document format conversion between Compu-Tune, Inc.'s CTOS (CompuTune Office System) word processing, Micropro International, Inc.'s Wordstar and DEC's Decmate II. According to the company, manuscripts authored on different systems can be edited by any system. Word-to-Word can be accessed by all of DEC's office computer systems.

As an example, the company said the use of Word-to-Word shows a VAX-11 computer running CTOS to

accept a document from Decmate word processing and translate it into a CTOS document format for editing by a VAX-11 terminal user. Similar conversions can be made between the Professional 266 with CTOS, Wordstar on the Rainbow and the Decmate II.

Word-to-Word is priced at \$2,000 for the VAX-11 and \$195 for the Professional 266.

Aquidock Data, P.O. Box 659, Newport, R.I. 02840.

#### DATA PROCESSING DESIGN, INC. Version 3.0 of Word-11

Data Processing Design, Inc. has announced Version 3.0 of its Word-11 word processing software package for operation on Digital Equipment

Corp. PDP-11 small business computers with DEC's RSTS/E operating system.

Version 3.0 enhancements reportedly include an advanced system management utility, scientific character set support for DEC VT100 terminals and the Diablo Systems, Inc. 630 serial printer, journaling and military-style paragraph numbering and support for the Xerox Corp. 2700 laser printer.

According to the vendor, the word processing management utility enables system managers to customize their installations by specifying access and security passwords for both devices and documents. It also has the capability to perform spelling functions with a single command, the vendor said.

Continued on page 48



## SOFTWARE &amp; SERVICES

Continued from page 47

Prices for Version 2.0 for PDP-11s range from \$3,500 for large systems to \$3,500 for Micro-11s.

Data Processing Design, 1400 N. Brinker, Anaheim, Calif. 92707.

#### DATA 3 SYSTEMS, INC. Hirs 30-5

Data 3 Systems, Inc. has announced a detail capacity module for IBM System/30

minicomputers.

MRPS (Manufacturers Resources Planning System) 30-5 is reportedly designed specifically for the IBM system and was written completely in RPG II.

The module's features include on-line interactive processing, two-level master schedule logic and the ability to store up to 600 entities concurrently in one data base, according to a vendor spokesman.

The package is priced at \$39,000.

Data 3 Systems, P.O. Box 411, Santa Rosa, Calif. 95402.

#### DELTA SOFTWARE SYSTEMS Hirs

Delta Software Systems has announced the Human Resources Information System (Hirs), a series of six individual program modules

that are available for a variety of microcomputers and minicomputers.

According to the vendor, the following modules can function independently or can be integrated: Software Solutions, Inc.'s Database operating system; administration program; applicant tracking; benefits plan accounting; position control; government compliance; and payroll interface.

The Hirs system is com-

patible with Software Arts, Inc.'s Data Interchange Format, allowing the system to integrate with most popular spreadsheets, graphics and word processing packages, the vendor said.

The vendor said the software can support up to 150 employee records on an IBM Personal Computer, up to 2,000 employees on an IBM Personal Computer XT and over 2,000 employees on a minicomputer.

The micro versions of Hirs range in price from \$595 to \$1,190 and run on the IBM Personal Computer; Digital Equipment Corp. Rainbow; Tams Instruments, Inc. Professional; Wang Laboratories, Inc. Professional Computer; and Victor Business Products, Inc. Victor 9000.

Hirs modules for minis range in price from \$4,950 to \$10,300 and run on the IBM System/34, 36 and 38; DEC VAX-11/730; Hewlett-Packard Co. HP 9000; Wang VS-45; TI 990 and TI Business System 900.

Delta Software, 572 Washington St., Wellesley, Mass. 02181.

#### TECHNICON DATA SYSTEMS CORP. Materials Management

Technicon Data Systems Corp. has announced inventory control for hospitals using the Wang Laboratories, Inc. VS series of processors.

Materials Management can function in a stand-alone mode or can be integrated with Technicon's Medical Information System software. It is said to increase efficiency for hospitals' inventory, purchasing, receiving and accounts payable departments through interactive files updated from many sources and shared with other files. Updated information reflects inventory levels at all points in the inventory cycle, the vendor said, and is available on-screen to all users.

A series of standard reports is included. Automatic purchase order generation and automatic general ledger and accounts payable interfaces are also included. Materials Management is priced at \$125,000 on Wang VS 50 and higher systems.

Technicon Data Systems, 5285 Glenridge Drive, Atlanta, Ga. 30322.

#### INFO PROJECTIONS, INC. Info System Plus

Info Projections, Inc. has announced Info System Plus, a modular mail-order processing package dedicated to interpreting market trends.

The system is menu-driven and is available for installation on the IBM System/34 and 36, according to the vendor.

Some of the product's applications include on-line order processing, on-line cus-

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## SOFTWARE &amp; SERVICES

tomer service, inventory and back-order control, sales and media analysis, lot maintenance, returns system, physical inventory system and hold system, the vendor said.

The package provides custom format for invoices, back-order cards, list maintenance and four-up labels. The price, the vendor said, is \$24,000.

*John Projections, P.O. Box 3069, Broomfield, Colo. 80401.*

#### SHLASS & YOUNG INFORMATION SYSTEMS, INC.

Creams and Beam enhancements

Shlass & Young Information Systems, Inc. has announced a series of enhancements to its real estate software systems for the Wang Laboratories, Inc. 2300 series minicomputers.

The vendor said the enhancements to the Comprehensive Real Estate Asset Management System (Creams) and the Real Estate Analytical Models (Beam) packages were designed to improve ease of use, add analytical capabilities, provide additional reporting capabilities and respond to changes in the way leases are written on commercial properties.

Menus were redesigned to reduce their number and to permit movement through the systems with fewer keystrokes. The packages now also offer the user a choice of instant-by-instant market rent data entry or a global creation or update facility.

The Creams package is priced at \$26,000, and the Beam package is priced at \$9,000.

*Shlass & Young Information Systems, 405 N. Wabash Ave., Chicago, Ill. 60611.*

#### EVALUATION AND PLANNING SYSTEMS, INC.

User Support Network

Evaluation and Planning Systems, Inc. (EPS) has announced a three-level technical support service for its FCS-EPS decision support system.

The User Support Network comprises these three levels:

■ **Level one** — Local support. EPS account managers are deployed on the local branch office level to provide ongoing contact and support for routine questions.

■ **Level two** — Regional support. EPS specialists trained to handle specific classes of applications and technical questions are resident in the EPS regional offices in Los Angeles, Chicago, New York and Toronto.

■ **Level three** — The System and Product Information Group. A team of systems and product technicians will be located at EPS North American headquarters and

will handle both end-user application and system support requirements, the vendor said.

Support staff from Levels two and three are available for on-site consulting engagements. The cost of the User Support Network is covered by the annual maintenance fee, which ranges between 12% and 16% of the purchase price, a spokesman said.

*EPS, 1 Industrial Drive, Waltham, N.E. 05067.*

#### DATA BASE MANAGEMENT SYSTEMS

SEI, INC.  
SEI/DBMS

SEI, Inc. has introduced a data base management system (DBMS) that is said to run under AOS/VS and Data General Corp.'s Sphnix operating systems on DG Rcligos

RV series computers.

The SEI/DBMS is a system that has the ability to support relational, hierarchical and network data structures at the same time, a vendor spokesman said.

According to the vendor, standard facilities include a fourth-generation retrieval language, a flexible report generator capable of creating custom-ready tabular output, direct interfaces to statistical packages such as

SPSS, Inc.'s SPSS, on-line Help materials and facilities for data security and editing. The system also includes descriptive statistics as well as an interactive retrieval processor.

According to the vendor, a host-language interface is also available so users can directly access and update the data base using programs written in Fortran, Cobol and other languages.

See DBMS page 50

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**codex**  
COMMUNICATIONS AND  
TELETYPE EQUIPMENT

## SOFTWARE &amp; SERVICES

## DBMS

from page 40

Prices for a first-year license for Star/DBMS range from \$30,000 to \$60,000, depending on options and CPU size, according to a vendor spokesman.

Star, P.O. Box 1404, Evanston, IL 60224.

## COMPUTER RESOURCES, INC.

Relate/3000 Version 4.4

Computer Resources, Inc. (CRI) has announced Version 4.4 of its Relate/3000 integrated relational data base management system (DBMS) for Hewlett-Packard Co.'s HP 3000 processors.

A spokesman said the enhanced version of Relate/3000 features improvements to the package's menu

system, including an expanded on-line help facility and greater user control over selection parameters. The menu system provides a fill-in-the-blanks approach to allow users to create and manipulate data bases, create custom reports and generate color graphs and plots.

In addition, Relate/3000 features enhancements to the firm's Create report writer option and the Graf color graphics option. The system works on all HP 3000 computers under HP's MPE operating system. It is priced at \$18,500.

CRI, 5330 Betsy Ross Drive, Santa Clara, Calif. 95054.

## DATA SYSTEMS FOR INDUSTRY

Mirror

Data Systems for Industry has an-

nounced a data base management system for users of Stratus Computers, Inc.'s Stratus/32 fault-tolerant computer systems.

The software, called Mirror, is said to feature a network structure; password security at data base and data set levels; serial, direct, calculated, chained and beam; and multi-threaded data base access.

Mirror is also compatible with Hewlett-Packard Co.'s Image/3000, providing a migration path for image-based applications to a fault-tolerant multiprocessor environment, according to a spokesman for the vendor.

The product is priced at \$15,000, the spokesman said.

Data Systems for Industry, 3045 Service Ave., Los Alamitos, Calif. 90720.

## VALUE COMPUTING, INC.

IDMS Accounting Subsystem

Value Computing, Inc. has announced the IDMS Accounting Subsystem, which produces performance and accounting reports and provides utilization statistics for users of Cullinet Software, Inc.'s IDMS data base management system.

The system reportedly extracts data from the IDMS log and reports IDMS internal task and transaction activity, external run units for batch programs and for tasks executing in another region and terminal activity. It includes an interface to Value's Comput-A-Charge data center accounting and billing system.

The system runs on the IBM 370, 30 series and 4380 series processors under IBM's DOS/VS, VSE-1 and MVS operating systems, according to the vendor.

The purchase price is \$5,000. A 15-month lease is available for \$460 per month.

Value Computing, 408 N. Kings Highway, Cherry Hill, N.J. 08024.

## NDX CORP.

Crestabase price change

NDX Corp. has announced a new price schedule, including some decreases, for perpetual licenses of its Crestabase data base management software. It also has established a monthly rental plan to introduce Crestabases.

The new prices for perpetual licenses of the Crestabase software, listed with the systems on which the product runs, are: Sperry Corp. Sperry 1100/40, 1100/60, 1100/70, \$35,000; Sperry 1100/90, \$45,000; Control Data Corp. Cyber 175 and 875, \$50,000; CDC Cyber 175 and 170/750, \$35,000; Cyber 170/750, \$40,000; IBM 4341 series, \$25,000; 9000 series, \$45,000; 9030 series, \$35,000; Hewlett-Packard Co. HP 3000 System 2, \$10,000, and HP 3000/64, \$20,000; West Systems, Inc. System 150, \$2,500; Systems 200 and 220, \$5,000; Cray Research, Inc. 1/M, \$75,000, and X-MP, \$95,000.

Perpetual licenses are available for Tandem Computer, Inc. Nonstop and Nonstop II computers, with pricing based on their number of CPUs. Prices begin at \$15,000 for two CPUs and range to \$50,000 for 16 CPUs. Monthly rentals of Crestabase range from a low of \$150, for use on a West 150, to a high of \$4,750, for a Cray X-MP, the vendor said.

NDX, 5360 Greensboro Drive, McLean, Va. 22102.

## VISTA COMPUTER, INC.

Database enhancement

Vista Computer, Inc. has enhanced its Database data base software to include a cross-tabulation feature that reportedly permits users to create singularly changeable and individualized cross-tabulations.

The cross-tabulation feature is said to permit creation of comparative tables from any subset of the data base with no need to work with the entire data base.

The enhancement can reportedly deal with 250,000 records and hundreds of data fields. It is available for \$20,000 for Data General Corp. Nova and Eclipse series processors and \$25,000 for DG's MV series computers under ACR/VS.

Vista Computer, 85 Executive Blvd., Elmsford, N.Y. 10523.

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## SOFTWARE &amp; SERVICES

**SIGNAL TECHNOLOGY, INC.**  
Smartstar 30-day trial

Signal Technology, Inc. is offering 30-day trial packages and disk demonstrations of its Smartstar integrated data management software. Smartstar reportedly consists of two fourth-generation software productivity tools, Smartdesign and Smartquery.

Smartdesign is the system's application designer, and Smartquery is the fourth-generation query program for execution of those applications, according to the vendor. The Smartstar software will reportedly run on any Digital Equipment Corp. computer under the VMS operating system.

The 30-day trial package for Smartstar is available for \$200 and includes a set of documentation, a nine-track magnetic tape and demonstration materials for VAX/VMS 3.1. The price of the trial package will reportedly be refunded if Smartstar is purchased within 60 days.

Smartstar is available for the following computers at the following prices: VAX-11/730, \$4,000; VAX-11/750, \$6,000; VAX-11/780, \$7,000; and VAX-11/785, \$7,000.

Signal Technology, 5051 Shasta Road, Golden, Calif. 92617.

## LANGUAGES

**TOWER SOFTWARE, INC.**  
Slueth

Tower Software, Inc. has introduced Slueth, a debugging package for Cobol users on Hewlett-Packard Co. HP 3000 systems.

According to the vendor, Slueth creates a running audit trail in a easy-to-read format. It can be displayed on a screen or printed. Slueth sells for \$1,500 for a long-term license.

Tower Software, 288 15th Place, Manhattan Beach, Calif. 90266.

**STS SYSTEMS LTD.**  
MINI-COMPUTER SYSTEMS, INC.  
VB/Basic

STS Systems Ltd. of Canada and Mini-Computer Systems, Inc. (Micos) of Elmsford, N.Y., have announced development of VB/Basic, which will reportedly allow Micos' Extensive Basic to run on all Data General Corp. 32-bit Eclipse MV series computers.

VB/Basic reportedly implements the Extensive Basic language under DG's AOS/VS operating system and permits programs written in other DG-supported languages to access VB/Basic. Other languages supported under AOS/VS include Cobol, Fortran, PL/I, APL and RPO-IL.

STS Systems is an OEM supplier of DEC computers and provides the VB/Basic language for \$7,000 to customers for its custom-configured DG MV series computers.

STS Systems, 9577 Côte de Léves, Dorval, Que., Canada H9P 1A3.

## REMOTE COMPUTING SERVICES

**GENERAL ELECTRIC INFORMATION SERVICES CO.**  
Mark III

General Electric Information Services Co. (Gelco) has introduced the

first product in its electronic software distribution service. The Mark III professional workstation is a software package that provides an interface to the vendor's teleprocessing network.

The product is geared toward system developers, programmers, financial analysts, business planners and data base administrators who are using the IBM Personal Computer in conjunction with GE's host processing services.

According to the vendor, the Mark III is available to Gelco clients for the cost of the teleprocessing resources used in downloading. At 1,200 bit/sec, the software and on-line documentation can be distributed in less than 30 minutes at a cost of approximately \$60.

Gelco, 401 N. Washington St., Rockville, Md. 20850.

## ON-LINE DATA BASES

**BUSINESS RESEARCH CORP.**  
Investext

Business Research Corp. has announced that a data base of over 7,000 investment banking research reports from 26 foreign and domestic brokerage firms has been added to the Lockheed Dialog Information Retrieval Service, Inc. network.

The data base, called Investext, reportedly can be searched by industry, company, product, analysis, source publication date and Standard Industrial Classification code. With Dialog's retrieval software, data base searchers can reportedly construct their own search queries to obtain specific pages or complete reports from Investext's more than 45,000 pages of research.

Access to Investext on the Dialog Information Retrieval Service is \$96/hour for connect time, \$4.50/text record and/or 35 cents/telegraphic record provided off-line. Investext is also available on the Strategic Information Systems, Inc. time-sharing system for a connect time charge of \$96/hour.

Business Research, 1660 Soldiers Field Road, Boston, Mass. 02135.

## METHODOLOGIES

**DECISION DESIGN RESEARCH CORP.**  
System Sizer

Decision Design Research, Inc. (DDR) has announced the System Sizer service, which is said to automate the process of requirements definition.

According to the vendor, the System Sizer service provides rapid definition and organization of system specifications for all financial applications.

Through the service, DDR reportedly processes a firm's requirements data and generates a Request for Proposal.

The service includes all required materials, charts, diagrams and descriptions in a 172-page reference book.

The System Sizer service costs \$175 for all applications, the vendor said.

DDR, Box 113, Chadds Ford, Pa. 19317.

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## SOFTWARE &amp; SERVICES

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order and what other parts he can use."

Integration is also key in radiation work permits, a module that shows which employees are cleared for work in radioactive areas. The application will be tied into the site's personnel and work request modules so that a work request can immediately generate a list of employees who are cleared for the job. Since workers can only be exposed to a certain amount of radioactivity per month, "we can't afford to have the radiation work permit system down for a min-

ute," Speed said.

To tackle the massive design process, FSNIH is using SDM-70, a life-cycle methodology from ADB Management Systems, Inc. The Finis team has also used a system requirements definition tool written in-house to define data elements, business functions and transactions. It shows logical integration points and generates a business model usable during all phases of the life cycle.

Revised extensively for the Seabrook environment, SDM-70 has been "tedious, but has worked well," according to Richard Boncal, Finis project manager. Re-

quirements Supervisor John DeWitt said that it has been effective in the uncertain environment of Seabrook, but wouldn't recommend the methodology for all information system projects.

"A lot of things we'll need to know aren't well defined yet," he said. "This forces us to be very structured and to document procedures manually before we automate them. It gives us a processing model of how functions are carried out. From there we can go to a data model and then to a prototype."

Prototyping has been an integral part of Finis. ADB/On-Line has enabled prototype screens to be generated

quickly during the coding phase, Boncal said. In addition, FSNIH is using Inquire to put up a number of temporary production applications that have to be running before Finis goes on-line.

Inquire has fulfilled two basic functions, Speed said. "It helps to elicit requirements that go into the system design aspect," he said, adding, "Probably 40% to 60% of our work in the data base group is devoted to making enhancements brought about largely by Inquire."

About a half-dozen complete applications have been developed under Inquire, and "we're getting new requests right and left," according to

Mark Boucher, a data base analyst and principal Inquire programmer. "The beauty of it is its speed," Boucher said. "We get requirements, build a field definitions table, put it under test, build screens and present it to the user who approves it and defines what macros he wants. We've put up some systems in a couple of weeks."

When Finis is installed, the staff will save data in Inquire applications by saving it into Infodata Standard Input Format and writing Cobol routines to move it to IDMS. IDMS maps will be used to parallel Inquire screens, and ADB/On-Line dialogue will replace the Inquire macros.

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## MBA from page 43

micros and three or four printers will be set aside with a hard-wire link to the mainframe via the campus' coaxial cable network.

As examples of the cases the students might encounter, Lawson cited a human resource management system problem in which most of the data resides on the mainframe. The students could use a mainframe-based statistical package to extract relevant data and download it to the micros. Another example concerns the voluminous data needed by managers to make merger and acquisition decisions. "There's a lot of data involved there, and the methods to use it in concert with local software are a tremendous problem," Lawson said.

## Sample data bases

The sample data bases are currently being built by the MIS faculty, but Lawson said the school hopes to obtain actual copies of outdated corporate data bases for use in the future. BU is also seeking companies that might be interested in being the subject of future case studies.

Whether or not the BU experiment is ultimately successful is secondary to the idea behind it. In order to shed their nagging ivory tower image, business schools clearly must bring themselves more into line with their corporate neighbors.

The problem has been that business schools have tended to treat micros in the same manner as corporations have. They are a nice management tool, but not something that should be allowed to infringe upon the corporate data base. Schools, as Lawson sees it, "tend to just replicate typical education problems on the micro. They're using them for problems you can basically do with a pencil."

Businesses are now beginning to deal with the imposing problem of micro integration. It is encouraging to see the universities following suit.

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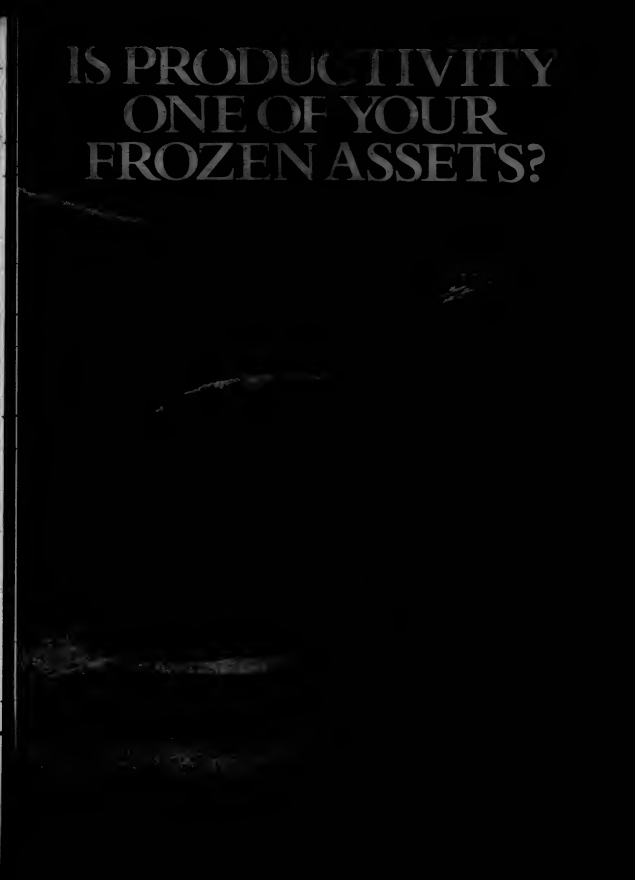
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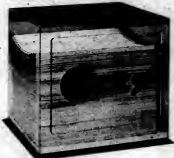
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# COMMUNICATIONS

## Firm taps PBX to boost computer accessibility

MAFEEVILLE, IL. — Necessity is not only the mother of invention, sometimes it is also the catalyst for change. When a chemical company here needed to expand computer accessibility without incurring more costs, tapping into the data communications capabilities of the already installed private branch exchange system proved a viable solution.

In 1979, Nalco Specialty Chemical Co. installed a Rolm Corp. Central Branch Exchange (CBX) and used it solely for voice. Sometime later, a problem began to develop in its data processing department: Each time another employee needed computer access, the company would have to lay more cable for a point-to-point installation that would cost as much as \$1,000. However, the majority of users only required computer access 20% of the time, a decreasing percentage with increased personal computer usage.

Conquering the problem was the fact that certain users needed two terminals on their desks in order to access program

tools and informational data bases supported by their multi-vendor MIS group.

Noting that Nalco needed a solution that would allow it to expand computer accessibility without incurring more costs, Diane Blinn, the company's corporate office facilities manager, suggested trying the data communications capability of the Rolm CBX.

### Use of installed wires

The data communications product would allow the company to transmit both voice and data using standard telephone wiring. Use of the installed telephone wiring would give all employees access to the computer resources. If needed, and employees could access any MIS data base from one terminal.

Jerry Pils, manager of technical support and operations, agreed to install 16 data terminal interfaces on a test basis because he did not believe the CBX could handle voice and data simultaneously as described. (Data terminal interfaces pro-

vide the connection between digital devices, such as terminals, and analog telephones.)

Two months after the trial, Pils said, "The CBX has provided a single-vendor solution to a problem that had required a multi-vendor approach. It has surpassed my expectations in fulfilling its specifications."

"To tell you how it's working out — we started with 16 data terminal interfaces, and we now have 60 installed," Blinn said. "That figure will go up because we're changing the processor on the system, so we'll have more capacity."

Meanwhile, the company's Rolm 7000 processor will be changed to a Rolm 8000 processor, and the Deimco II feature, which will give Nalco even greater capacity for data, will be installed.

Even further plans for upgrading the voice/data system are in store for Nalco. "In about a year and a half, we're upgrading to the Rolm CBX II system," Blinn said. "Obviously, we're very satisfied."

## INSIDE

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## Vendor service found key in telecom selection

By Lynn Maher  
CW Staff

Vendor reliability is equally important, if not more so, as cost when selecting a telecommunications system, telecommunications managers indicated to *Computerworld* last week.

When asked in a telephone interview what criteria were important when purchasing a telecommunications system, managers said that other than the fundamental position of the vendor to provide a system on a given date, key factors in the decision-making process were service and support and vendor viability (financial strength and market share).

"Cost is not always the big issue," according to Charles Hlavac, telecommunications manager of Crowley Maritime Corp. in San Francisco. "The real problem is service once you've installed the system. Some vendors simply walk away, and you're lucky if you can get support after that time."

For Hlavac, once the fundamental position of the vendor is established, the technical features of a system and system so-

*I'd have to say vendor reliability, which includes service and support, is most important. Then follows performance, viability of the vendor and cost.*

Harry M. Venable, director of communications at Celanese Corp.

phistication are investigated. "If we're dealing with a national company that has wholly owned subsidiaries, then we make a field trip to look at other installed equipment," Hlavac said.

"We also look at the warehouse situation and then attempt to determine the actual number of private branch exchange technicians this vendor has in a particular geographic location. One thing you don't want to end up being is someone's first customer."

For Dennis Ray, telecommunications manager at the University of Maryland in

College Park, a vendor's technical ability — in which also includes service and support — rates on a 50-50 standing with cost.

Another criterion Ray considers important in the selection of a telecommunications system is the system's ability to be multifunctional. "Voice and data communications capabilities are both important," Ray said, "and as a university, we also have some need for video applications."

Ray also said that "the ability to make changes and optimize a system by internal control rather than external control by the vendor is also very important."

While most telecommunications users would ideally like to get the best equipment at the lowest price, this approach is not necessarily realistic. According to Harry M. Venable, director of communications for Celanese Corp. of Charlotte, N.C., system cost is important, but not as important as other criteria.

"I'd have to say vendor reliability, which includes service and support, is most important. Then follows performance, viability of the vendor and cost."

## Free guide offers info for managers about consultants

WILLOWDALE, Ont. — Angus Telemanagement Group, Inc. is offering free copies of its recently published "Managers Guide to Telecommunications Consultants."

The eight-page booklet consists of information about the consultant's role, the services consultants can provide, pitfalls to avoid and other information of interest to managers.

Further information is available from Angus Telemanagement Group, Suite 210, 2175 Sheppard Ave. E., Willowdale, Ontario, Canada M2J 1W7.

## Accunet's NY-London service debuts

NEW YORK — In partnership with British Telecom International, AT&T Communications, Inc. recently began offering its International Accunet Reserved 1.5 Service to business customers.

The service offers full-color international video teleconferencing between New York and London, according to AT&T Communications. International Accunet is a digital, two-way service that operates at 1.544M bit/sec.

While the service is capable of transmitting both voice and data communications, it was designed primarily for teleconferencing, which is said to be the most economical use of the service.

Typical charges for a service transmitted via the AT&T portion of a transatlantic circuit between New York and London would be \$625 for 30 minutes, an AT&T

spokesman said.

Similar charges would be paid by the London customer to British Telecom International for the portion of the circuit it would provide, according to AT&T.

### Connects 11 cities

Business customers outside of New York will have access to the London-to-New York service through AT&T's domestic Accunet Reserved 1.5 Service. This service connects public video teleconferencing facilities in 11 major cities, according to AT&T.

According to the AT&T spokesman, the company plans to include other international locations in the future.

Additional information is available from AT&T, which is located at 560 Madison Ave., New York, N.Y. 10022.



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## COMMUNICATIONS

PROTOCOL  
CONVERTERSMODEMPLUS, INC.  
SNA-P

Modemplus, Inc. has announced the SNA-P protocol converter, which reportedly interfaces any personal computer, minicomputer or dumb terminal to an IBM Synchronous Data Link Control/Systems Network Architecture mainframe via dial-up lines or leased lines or direct connect to an IBM 3706 front-end processor.

The product offers error detection/correction, a menu-driven display of selectable features and operates as a stand-alone, single port box, the vendor said.

The price is \$1,295.

Modemplus, 217 E. Trinity Place, P.O. Box 1787, Decatur, Ga. 30021.

MULTIPLEXERS/  
MODEMSCOMDESIGN, INC.  
TC-600A

Comdesign, Inc. has announced a 32-line TC-600A statistical multiplexer that features Flexpak modular firmware.

Flexpak allows users to field upgrade their units with the latest Comdesign software releases. The new enclosure can reportedly be configured from four to 32 channels and offers network monitoring, statistics gathering and network diagnostics among its standard features, a company spokesman said.

Each channel can be programmed for any combination of 5- to 9-baud bytes, with even, odd or no-parity, and 1-, 1¼-, or 2-stop bits. Speed selections range from 50 to 9,600 bit/sec, including two split speeds: 1,200/75 bit/sec and 1,200/150 bit/sec, the vendor said.

The price for the four-channel unit is \$1,700.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

FIBRONICS INTERNATIONAL, INC.  
Model FM 1000

Fibronics International, Inc. has announced an eight-port coaxial cable multiplexer designed for users of Memorex Corp.'s 2074 controller.

The multiplexer operates with 2078, 2079 and 2086 Memorex peripherals. It multiplexes eight controller ports over a standard coaxial cable at distances up to 4,000 ft. Each supported peripheral can be separated by 1,000 ft from the multiplexer, a company spokesman said.

The price is \$2,900 per pair.

Fibronics International, 218 W. Main St., Hyannis, Mass. 02601.

SOLANA ELECTRONICS  
Model 823

Solana Electronics has introduced the Model 822 multiplexer.

The multiplexer has an eight-channel capacity and allows computers and terminals to be separated up to 2,000 ft. Modems are not required, according to the vendor.

The product features data rates up to 9,600 bit/sec per channel with unrestricted internal speeds and codes, a company spokesman said.

The price is \$405.

Solana Electronics, 349 S. Highway 101, Solana Beach, Calif. 92075.

MULTI-TECH SYSTEMS, INC.  
Multimed

Multi-Tech Systems, Inc. has announced Multimed, a 300 to 1,800 bit/sec modem that has an internal battery-backed memory for up to six 31-digit phone numbers. These numbers can be automatically dialed once or continuously until the call is answered, the vendor said.

The modem's command mode is compatible with the Hayes Smartmodem 1500 commands and with most popular microcomputer communications packages, a company spokesman said.

Some of the product's features include pulse or tone dialing, line and call status display, keyboard or stored number dialing, automatic parity and data rate selection and automatic parity and data rate selection. The price is \$646.

Multi-Tech Systems, 85 Second Ave. S.E., New Brighton, Minn. 55112.

CTS CORP.  
Compen

CTS Corp. has introduced Compen, a Bell Laboratories 212A-compatible modem that can reportedly be connected to the RS-232 port of more than 100 types of personal computer configurations or can be menu driven from the keyboard of a data terminal equipment, a company spokesman said.

The modem allows asynchronous, full-duplex operation at 300 and 1,200 bit/sec and synchronous operation at 1,500 bit/sec. The unit supports keyboard diagnostics, including local analog loop-back, local digital loop-back and remote digital loop-back test.

Additional features include adaptive dialing, automatic answering and speed detection call progress monitoring, automatic storage and dialing of last phone number and two RJ11C jacks for both voice and data communications, according to the vendor.

The price is \$405.

CTS, 400 Reimann Ave., Sandwich, Ill. 60485.



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## COMMUNICATIONS

## TEST EQUIPMENT

**DIGILOG, INC.**  
Digilog 300, 400, 600, 800

Digilog, Inc. recently announced the 300, 400, 600 and 800 series of automatic protocol analyzers.

The Digilog 300 features automatic setup, remote control, menu-guided operation, fill-in-the-blanks programming, English language prompts and help screens and typewriter-style keyboard.

Other products in the line accommodate increasingly higher speed lines and capabilities. The 400 is for lines operating at up to 56K bit/sec; the 600 device is for 72K bit/sec lines; and the 800 is meant for use with lines operating up to 256K bit/sec.

The 800 series incorporates a 10M-byte Winchester disk, color CRT and Sony Corp. of America micro floppy and offers multilevel program operation.

The price for the Digilog 300 protocol analyzer is \$4,995; the 400 with

disk drive is \$8,295, \$7,495 without the disk; the 600 is priced at \$11,500; and the 800 costs \$18,500.

Digilog, 1370 Welch Road, Montgomerystown, Pa. 18905.

## AUXILIARY EQUIPMENT

**WESTERN UNION CORP.**

Price changes for Easylink

Western Union Corp. has announced new pricing for its Easylink

instant mail service, which requires no registration fee and no monthly service charge for subscribers as of April 1.

For the first 90 days after signing up for the service, users will have a minimum monthly usage charge of \$25, a company spokesman said.

The service contains protocol and speed and code conversion software that enables users to communicate over telephone lines with any other user on the network.

Western Union, One Lulu St., Upper Saddle River, N.J. 07655.

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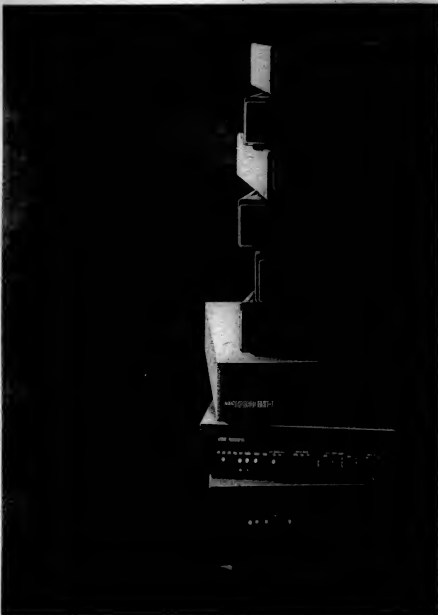
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NEC America, Inc.  
Data Communications Products



# SYSTEMS & PERIPHERALS

## Optical disks promising, but misunderstood

By Tom Webster  
CW Staff

FRAMINGHAM, Mass. — Despite positive predictions for its future, optical data storage still has its problems, not the least of which is that users somewhat misunderstand it. According to a recent report, optical data storage's expense and unreliability and the misconception that optical disk media cannot be erased are some reasons more users have not jumped on the optical bandwagon.

Optical disk storage has long been touted as one way large system users might fight the growing capacity, speed and space problems associated with conventional magnetic media disk drives. The advantages of optical storage, noted the report's publishers, International Data Corp. (IDC), have been touted for some time. These include the users' ability to switch randomly from one section of a disk to another very quickly. And since optical disk drives use lasers instead of read/write heads, the chances of a head crash are virtually eliminated.

Furthermore, it is easy to remove and store the optical disk platter. With magnetic media disk drives, removable pack drives have sometimes caused problems when the disk media has been contaminated by dirt. And optical disks offer the ability to store both data and images, thus opening a new world of data storage to many users.

But there are problems, too. Optical disk drives are expensive. IDC noted that optical drives for larger systems range in price from about \$4,000 for a unit with a 10-byte capacity to upwards of \$200,000 for the so-called "jukebox" units, which can accommodate multiple disk platters. And the disks themselves are also expensive. The firm said a 10-byte optical disk platter costs from \$150 to \$350.

IDC predicts the price for optical disk drives probably will not come down until more vendors start mass-producing them.

But even though the initial cost is high, the market research firm was quick to note the cost of 1M bytes of optical storage is significantly less than 1M bytes of storage on magnetic media disk drives. For example, a 40-byte optical disk drive costs roughly \$6 per 1M bytes of storage. IBM's top-of-the-line 3380 magnetic media 3390 disk drive costs roughly \$40 per 1M bytes, and conventional magnetic tape drives cost

Year	Price/MB
1983	1**
1984	40
1985	90
1986	210
1987	510
1988	1,600
1989	4,400
1990	8,700

\* Does not include controller  
\*\* Includes preproduction models

roughly \$150 per 1M bytes, IDC said.

Reliability is another issue that has caused some manufacturers to shy away from the development of optical drives. The report noted that the bit error rate on optical disk drives appears to be significantly higher than on conventional magnetic media drives.

For example, manufacturers of magnetic media disk drives can produce a disk media that has a fairly error-free surface. For example, using error correction codes (ECC), which are basically a series of algorithms aimed at pinpointing faults, manufacturers of magnetic media storage products have been highly successful in lowering error rates. However, the overhead required to support the ECC can be high, often taking up 10% to 50% of a disk platter. But the overhead required for error troubleshooting is even higher on opti-

cal disk drives, IDC reported.

The market research firm said some 10-byte optical disk drives on the market now from 200M to 600M bytes of storage for error correction. While the remaining 600M to 800M bytes is still a huge amount of storage, IDC noted that when the actual storage capacity is considered, the economy of optical disk drives may begin to pale when compared to magnetic media devices.

Furthermore, the report stated, the number of errors that occur in the optical process are high when compared to magnetic storage. For example, IDC said an error on an optical disk is possible every 1 X 10<sup>-8</sup> to 1 X 10<sup>-10</sup> bytes. That means an error could occur in every 100K bytes to 1M bytes. Magnetic media disk drives have an error rate ranging from 1 X 10<sup>-4</sup> to 1 X 10<sup>-14</sup> bytes.

The report noted that for DP applications, disk error rates have to be in the 1 X 10<sup>-10</sup> to 1 X 10<sup>-14</sup> to be acceptable to users. Possibly due to the problems associated with the optical drives, such as the bit error rate, nonstandardization and a lack of control software, IDC said the optical market has been a slow starter. The firm noted that some domestic firms have pushed back initial delivery dates on optical products.

But Japanese firms, like Hitachi Ltd., have already begun shipments in Japan and will probably begin domestic deliveries in late 1984.

The report also noted that many users have the misconception that optical disks are not erasable. Actually, the report explained, there are three techniques commonly used to record data on optical disk drives, and only two of them are permanent. The ablative technique uses a high-power laser to burn a hole in the disk media. A similar bubble technique forms a tiny blister between a metal layer on the disk and the disk substrate. The third

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Decision Data Computer Corp. announced a workstation for IBM's System/38, System/36 and System/34 processors that also features compatibility with the IBM Personal Computer/06.

Ford Higgins Ltd. recently unveiled a general-purpose minicomputer based on DEC's PDP-11/23/06.

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## VAX-11/750-based superminicomputer released

WESTMONT, Ill. — First Computer Corp. has announced a superminicomputer system based on the Digital Equipment Corp. VAX-11/750.

The Orion 750-1 offers twice the speed, capacity and performance of First Computer's Orion 750 system, according to the company.

The Orion 750-1 features 2M bytes of

memory and 134.8M bytes of formatted storage provided by a fixed storage drive disk emulating dual DEC RM403 drives. Mounting space is available for an additional fixed storage drive or a 57.4M-byte removable storage drive.

The system includes an autoloading, self-threading 92M-byte tape drive for backup, a free-standing DEC LA120 Dec-

writer III printing terminal and a license for DEC's VAX/VMS operating system.

The system was designed as a general purpose computer targeted at OEMs and multi-unit end users.

A typical price is \$70,000, although quantity and other discounts apply.

First Computer Corp. is located at 645 Blackhawk Drive, Westmont, Ill. 60069.

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## SYSTEMS &amp; PERIPHERALS

## Firm offers dual-function workstation

**BOEHAM, Pa.** — Decision Data Computer Corp. has announced a dual-function workstation designed for use with IBM System/34, System/36 and System/38 processors.

The DOCC-61 workstation is reportedly compatible with the IBM Personal Computer for local applications processing and the IBM 5250 family of terminals. That compatibility is intended to provide the workstation with the flexibility to act as a free-standing personal computer capable of running IBM Personal Computer software plus the ability to ac-

cess mainframe applications and data bases on the System/34, System/36 and System/38.

Standard software is said to include advanced-function Basic and Microsoft, Inc.'s MS-DOS operating system.

The workstation includes an Intel Corp. 8088 microprocessor, 128K bytes of random-access memory (expandable to 640K bytes), two 5¼-in. diskette drives with 560K bytes of storage each and a monochrome monitor. Four expansion slots are available for additional boards, according

to the vendor.

According to the company, a hot key sequence allows the operator to switch between computing and terminal emulation functions, while the adjustable, low-profile, 83-pad keyboard has dual legends for supporting the separate operations.

Deliveries are scheduled for April or May. The workstation is priced at \$3,184, and the emulation software is priced at \$800. Decision Data Computer is located at 100 Witmer Road, Hershman, Pa. 19044.

## Ford Higgins introduces general-purpose mini

**BOULDER, Colo.** — Ford Higgins Ltd. has announced the Powerframe Model 2340, a general-purpose minicomputer designed for multitasking, multiuser environments.

The 2340 is based on the Digital Equipment Corp. PDP-11/23 Plus processor and can use DEC's RSTS, RT-11 and RSX operating systems. Features include an 8-in., fixed/removable, 400K-byte rigid disk drive, 256K bytes of random-access memory, dual ports and an expandable system pedestal cabinet. The cabinet

contains a slide-out wire cage providing internal access to exchange logic or memory boards and storage subsystems.

The chassis has slots for expanding memory to 4M bytes and allows the addition of an expansion module.

The company's Rewindrive disk storage subsystem features 20M bytes of storage on fixed media and 20M bytes on a removable cartridge, the vendor said.

According to Ford Higgins, the 2340 is practical for up to 12 concurrent

users.

The company said that future 16-bit and 32-bit systems based on DEC, Motorola, Inc. and National Semiconductor Corp. processors may be added onto the 2340.

The company reported that the Powerframe series is intended for sale primarily to OEMs and to large-quantity end users.

Available now, the Powerframe 2340 is priced at \$13,960.

Ford Higgins is located at 4755 Walnut St., Boulder, Colo. 80301.

### TURKEY SYSTEMS

**OMNILOGIC, INC.**  
Personal Banker System 1000

Omnilogic, Inc. has announced its Personal Banker System 1000, a group of at least 1,000 home banking terminals linked by phone lines to a minicomputer, which reportedly provides a full range of electronic home banking services.

The terminals reportedly provide displays and printed copies of trans-

actions and communicate with their host, a Flexus Computers, Inc. P/80 minicomputer, using a proprietary method said to provide a level of security. The host computer is included as part of the system and is operated by the bank.

The system can reportedly be upgraded to support many terminals, each of which is only on-line with the processor at the beginning and end of a banking session. Most of each transaction's processing is done off-line. When the transaction is finished, the terminal sends the infor-

mation to the system's computer and prints a numbered receipt.

Each terminal weighs about a pound and operates as a clock when not in use, displaying the time on its two-line LCD screen.

The Personal Banker System 1000, with 1,000 home banking terminals and a fully programmed CPU, is priced at \$445,000. Additional terminals are \$165 each, in lots of 1,000.

Omnilogic, Suite 1100, 401 Wilshire Blvd., Santa Monica, Calif. 90401.

See SYSTEM page 70

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## SYSTEMS &amp; PERIPHERALS

SYSTEM from page 68

## BANCHEER COMPUTER ASSOCIATES, INC. Profile

Bancheer Computer Associates, Inc. has announced a line of turnkey minicomputer systems said to be designed for commercial banks and thrift institutions with assets of up to \$1 billion.

The bundled Profit system hardware and software packages reportedly utilize Digital Equipment Corp. PDP-11 or VAX-11 series processors and are said to offer transaction modules covering every type of banking activity.

A deposit processing module features subsystems for statement and passbook savings, certificates of deposit, individual Retirement Accounts and NOW accounts, according to a vendor spokeswoman.

The spokeswoman said the transaction modules interact as a comprehensive Customer Information File and can interface with the bank's core ledger.

The systems reportedly give banks the ability to perform profit analyses by customer and target marketing programs based on user-set parameters.

Profile II utilizes a DEC PDP-11/23 mini; Profile III, a PDP-11/44; Profile IV, a VAX-11/760; and Profile V, a VAX-11/780 mini, the vendor said.

The systems are available now and are priced between \$78,000 and \$1.5 million, the spokeswoman said.

Bancheer Computer Associates, Phoenicia Circle and Charleston Road, Mahwah, Pa. 18955.

## PROCESSORS

## MERCURY COMPUTER SYSTEMS, INC. Zip 2300 Series

Mercury Computer Systems, Inc. has announced a line of software-programmable, single processors for microcomputer-based systems.

The Zip 2300 Series was designed for applications in image, signal, graphics and scientific processing. It is based on dual processor data flow architectures and offers a choice of pipelined arithmetic processors. According to the company, it is offered for sale to OEMs.

The company said that its Zip 2316, available on a 30-day lead time, performs 16-bit (block floating point) arithmetic at 20 million computations per second and 32-bit arithmetic at five million computations per second. Its primary target is image and signal processing applications.

The Zip 2322, scheduled for delivery in the fourth quarter of 1984, performs 32-bit (floating point) arithmetic at 10 million calculations per second, according to the company. Its primary targets are graphics and scientific applications.

Both processors operate concurrently with a 10-million instructions per second control processor and an internal 40M byte/sec bus which connects all system components.

In their base configurations, the products consist of a three-board multibus card set with the pipeline on one card. Basic main memory is 128K bytes, with memory expansion available in 512K-byte increments up to 16M

bytes, the company said.

The Zip 2316 is priced at \$8,000, while the Zip 2322 is expected to be priced at \$10,000. OEM discounts are available.

Mercury Computer Systems, 600 Suffolk St., Lowell, Mass. 01854.

## DATA STORAGE

## BERING INDUSTRIES, INC. Eight disk drives; Option 680

Bering Industries, Inc. has announced eight additions to its Series 3000 Winchester disk drive family. The firm also announced a firmware enhancement that allows file-sharing among two or three Hewlett-Packard Co. computers.

The eight disk drive models provide 20 basic configurations and feature capacities ranging from 5M bytes to 30M bytes. They may include built-in 3 1/4-in., 5 1/4-in. or 8-in. floppy disk drives. Each system includes an integral power supply and controller

and features an average transfer rate of 174K byte/sec.

Delivery is within 30 days.

The models include the Model 3000, ranging in price from \$2,440 for 5M bytes to \$4,680 for 30M bytes; Model 3500, including a 3 1/4-in. floppy drive, ranging in price from \$2,840 to \$4,960; Model 3600, including a 5 1/4-in. floppy drive, costing from \$3,250 to \$5,890; and Model 3800, with an 8-in. floppy drive, ranging from \$4,250 to \$6,500.

The firmware enhancement, Option 680, resides in the Series 3000 disk controller and arbitrates the use of a common data storage area in the hard disk. Each computer requests access to that area through its own port. The option is intended to allow file-sharing in applications that don't require a full-scale local-area network.

The firmware is said to offer three sizes of shared information space — 1.2M bytes, 4.9M bytes and 9.5M bytes — and to allow each computer to access the space

via software control.

According to Bering, the firmware is compatible with all HP technical and personal computers. Option 680 is available on new Series 3000 models and for factory upgrades for the installed base.

Option 680 is priced at \$480 including a software utility. A two-port option costs \$700, and a three-port option costs \$850.

Bering, 1400 Patton Place, Fremont, Calif. 94538.

DATA SYSTEMS DESIGN Seagras

Data Systems Design has announced Seagras, a tape subsystem for Digital Equipment Corp.'s PDP-11 and other systems which use DEC's Q bus.

Seagras, a 14-in. tape system, emulates DEC's TSVO6/TS-11 subsystems, employs a true stop and start tape and permits use of backup commands such as REW, FIF and SAV/RES, the vendor said. The unit includes power-on confidence tests to confirm drive-to-controller connection.

*Continued on page 72*

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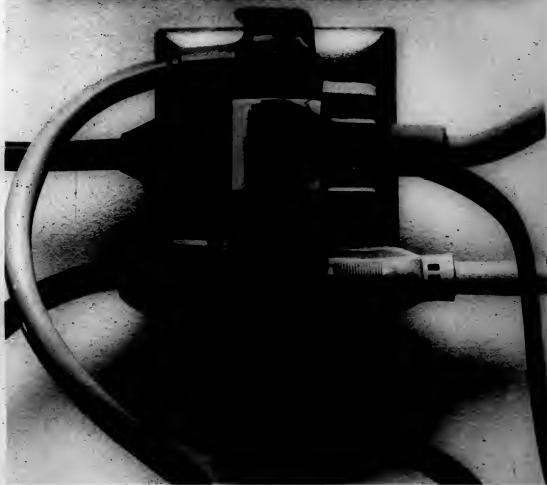
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## SYSTEMS &amp; PERIPHERALS

Continued from page 70

tics and to test internal controller logic, according to the vendor. On-line diagnostic tests check test controller read and write circuitry and last error code and microcode version number displays, the vendor said.

Snapac costs \$3,495.

Data Systems Design, 2241 Lundy Ave., San Jose, Calif. 95131.

#### COMPUTER AUTOMATION, INC.

Streaming tape subsystem

Computer Automation, Inc. has introduced an 8-in. streaming tape subsystem designed for system file backup and archive storage for fixed Winchester and removable media disk drives.

The subsystem, which reportedly can back up 45M bytes of formatted data on one cartridge, uses Anal-standard 14-in. tape and permits the interchange of data between user sites. The subsystem is also said to eliminate the need to update individual records by incorporating very short inter-record gaps with constant tape motion.

The subsystem is priced at \$3,995, with quantity discounts available, the vendor said.

Computer Automation, Nahant Mini Division, 18651 Van Korman, Irvine, Calif. 92713.

#### MICRO TECHNOLOGY, INC.

MSV06

Micro Technology, Inc. has introduced a streaming tape controller for use with the Digital Equipment Corp.

Q-bus. The unit reportedly provides up to 45M bytes of backup capacity in less than nine minutes.

The controller, the MSV06, is a single board said to contain all the circuitry needed to emulate DEC's TS060 subsystem. The MSV06 interfaces with cartridge drives from Archive Corp., Cipher Data Products, Inc. and Tandberg Data Storage, Inc. It is also said to include block-mode direct memory access and the ability to support multiple drives.

The controller is priced at \$1,425, with quantity discounts available.

Micro Technology, 1630 Miraloma Ave., Placentia, Calif. 92670.

#### MICRO TECHNOLOGY, INC.

MX22 floppy disk controller

Micro Technology, Inc. has introduced a controller for floppy disk drives running on Digital Equipment Corp. Unibus computers, particularly DEC's VAX-11/730 superminicomputer.

The product reportedly permits users to add additional floppy drive drives beyond those, if any, provided by the manufacturer.

The controller, the MX22, is a quad-size board which can reportedly emulate up to four DEC RX02 floppy disk drive subsystems. Users are able to interface either four 8-in. drives, four 5¼-in. drives or two of each. To interface with the DEC PDP-11 series minicomputers, the MX22 requires a single Unibus slot.

The MX22 also features self-diagnostics and on-board bootstrap and power-fail protection. A built-in LED

indicates fault status. The MX22 costs \$1,045, with quantity discounts available.

Micro Technology, 1630 Miraloma Ave., Placentia, Calif. 92670.

## TERMINALS

#### APPLIED DIGITAL DATA SYSTEMS, INC.

M1000

The M1000, an IBM Personal Computer-compatible workstation for the Mentor system business computer family, has been announced by Applied Digital Data Systems, Inc. (Add).

The M1000 workstation is designed for use in conjunction with a host Mentor system. It is said to allow users to extract specific data from Mentor host data bases in a Microsoft, Inc. MS-DOS-compatible format. Data can then be used in an MS-DOS application, and refined data can be returned to the host in a form compatible with the Mentor operating systems. Add said.

It enables users to utilize such MS-DOS applications as spreadsheets, word processing and graphing, the company noted, and allows them to integrate those programs under the control of the Add-enhanced Pick Associates, Inc. Pick operating system of the host Mentor.

Base price for the M1000 workstation

for the Mentor is \$2,665, including 128K bytes of random access memory (expandable to 768K), one 300K-byte diskette (expandable to two diskettes), a 13-in. monochrome display, keyboard and software. The MS-DOS-compatible software is bundled into the price of the M1000 and is also available separately priced to Mentor users.

Applied Digital Data Systems, 100 Marcus Blvd., Housatonic, N.Y. 11788.

#### SYSTEMS, TERMINALS AND COMMUNICATIONS CORP.

The Wang Compatible Terminal Workstation

Systems, Terminals and Communications Corp. has announced a series of terminals designed for use in the federal and general marketplace with Wang Laboratories, Inc. computers.

The Wang Compatible Terminal Workstation is based on the Applied Computer Sciences, Inc. ACS 5000 and is compatible with all Wang systems, the vendor said.

Features are said to include an optional alphanumeric screen, alpha lock key, an execute key positioned further away from the delete key than on Wang terminals and a detachable keyboard. Available now, the 10 models cost from \$2,100 to \$2,500.

Systems, Terminals and Communications, 1101 Vermont Ave. N.W., Washington, D.C. 20005.

See TERMINALS page 74

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## SYSTEMS &amp; PERIPHERALS

TERMINALS from page 72CPT CORP.  
8630, 8636

CPT Corp. has added two multi-functional workstations with increased memory capabilities to its 8600 series systems.

The 8630 and 8636 workstations are said to offer 224K bytes of random-access memory, black-and-white monitors, 85- to 96-char. keyboards and the vendor's operating system and software. The 8630 comes with an 8-in., single-sided, double-density disk drive. The 8636 includes an additional 318K-byte drive.

The workstations reportedly are compatible with the vendor's nonintegrated shared resource system

(SRSS4S) and, when combined with the vendor's Interactive Display Emulator, can run concurrent CPT text processing and terminal emulation data processing to a host mainframe. Data processing is also available through the vendor's Compapak interface to Digital Research, Inc.'s CP/M operating system.

Prices for the 8630 and 8636 start at \$5,000.

CPT, 8100 Mitchell Road, P.O. Box 895, Minneapolis, Minn. 55440.

## PRINTERS/PLOTTERS

TELEVIDEO SYSTEMS, INC.  
TP 750

Televideo Systems, Inc. has re-

leased a letter-quality, daisywheel printer for office use with micros, minis and word processors.

The TP 750 is said to run at 50 cycles/sec with a mean time between failures of over 5,000 hours. It has a standard Centronics Data Computer Corp. parallel interface and an optional serial interface and includes a bidirectional forms tractor.

The TP 750 offers 133 col. at 10 pitch and features pitch positions of 10, 12 or 15 with proportional spacing. It handles up to 271 char. and paper up to 15 in. wide. It features automatic bidirectional printing and automatic centering and justification. It is available now for \$1,595. The serial card is priced at \$90, the tractor feed at \$275.

Televideo Systems, 1170 Morse Ave., Sunnyvale, Calif. 94066.

HOUSTON INSTRUMENTS  
DMP-292

Houston Instruments has announced a flatbed plotter for Digital Equipment Corp. systems using DEC's Raster Graphics language.

The DMP-292 is an eight-pen, flatbed, Raster-Intelligent plotter using 844-by-11-in. or 11-by-17-in. media. According to the company, it features a .001-in. addressable resolution.

The DMP-292 is said to emulate DEC VT135 graphics terminals. Performance features reportedly include the ability to define window limits, scale plots up or down as required, vary line intensity, evoke European character sets and automatically describe circles, ellipses and general curves.

Available now, it is priced at \$2,295.

Houston Instruments, 8500 Cameron Road, Austin, Texas 78753.

## BOARD-LEVEL DEVICES

KONTROL ELECTRONICS  
RAM expansion option

Kontrol Electronics has announced a 2K bit/channel random-access memory (RAM) expansion option for its logic analyzers. It is said to double the amount of memory available to collect data for analysis. The option lets users be less specific about data they want to capture and collect a whole operation of sub-routines rather than pieces.

The Kontrol logic analyzers feature 32, 48 or 64 channels allowing 16-bit or 32-bit microprocessors to be analyzed. The RAM option is priced at \$2,000 for 32 channels, \$2,500 for 48 channels and \$3,000 for 64 channels. It is available immediately.

Kontrol Electronics, 680 Price Ave., Redwood City, Calif. 94063.

Pertek Corp.  
HEX-Q

Pertek Corp. has introduced HEX-Q, which links six Digital Equipment Corp. PDP-11 minicomputers in a distributed processing system.

The unit provides up to 256K bytes of random-access memory with transfer rates exceeding 135,000 16-bit words per second. HEX-Q has dual-height direct memory access cards in each computer and dual-height hexadecim (HEX) and interprocessor board (IPB) cards in the host. The HEX and IPB cards serve as the switch that hooks one of the six satellite computers to the host. Prices range from \$1,600 to \$4,500.

Pertek, 5550 Redwood Road, Oakland, Calif. 94618.

K-SYSTEMS, INC.  
KTL-106

K-Systems, Inc. has announced a printed circuit module that reportedly emulates Digital Equipment Corp. VT100 CRT terminals.

The KTL-100 dual-height board is provides full-duplex serial asynchronous channels for keyboard and computer interface and an RS170 composite video output for a monitor.

Installed in a standard DEC backplane or equivalent power source, it implements the Advanced Video Option, including 80/132 column, non-

Continued on page 76

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## SYSTEMS &amp; PERIPHERALS

Continued from page 74  
volatile setup parameters  
and display. It costs \$600.  
K-Systems, 3808 Lileac, Las  
Cruces, N.M. 88005.

### AUXILIARY EQUIPMENT

#### PRO-LOG CORP. RAM option

Pro-Log Corp. has an-

nounced a 64K-byte random-access memory buffer option for its M980 and M910A programmable read-only memory programmer control units. Existing M980 and M910A control units reportedly can be upgraded to the 64K-byte option.

With the buffer option, the M980-64 is priced at \$2,750.

Pro-Log, 2411 Garden Road, Monterey, Calif. 93940.

#### PERKIN-ELMER CORP. DAQ/7000

Perkin-Elmer Corp. has announced the DAQ/7000 digital and analog interface for the company's Series 7000 Professional Computer. It allows users to acquire data and output control to devices in the laboratory.

The product is a remote intelligent interface which communicates with the computer over the IEEE-488 bus.

The interfacing library in the package was designed to be used from either Basic or Fortran, and the library serves as the interface between a high-level language and the hardware.

Functions supported by the interface are I/O of analog signals, I/O of binary coded decimal, I/O of 8-bit parallel ports and of individual bits. It costs \$3,995.

PE, Main Ave., Norwalk, Conn. 06856.

#### MERIT SYSTEMS RS-523 Cable Tester

An RS-523 Cable Tester was recently announced by Merit Systems. The unit was designed to check RS-523C cables for broken or shorted wires without removing cables from under a floor or bringing both ends together.

According to the company, depressing a single rocker switch to either the "open" or "short" test mode displays the status of all 26 conductors on a 26-LED display.

The Cable Tester consists of a base and a turnaround which fit together for storage. Both the base, with mode switch and display, and turnaround have D655 male and female connectors. The unit costs \$250.

Merit Systems, P.O. Box 805, Norwalk, Conn. 06856.

### DISK from page 65

method, which IDC said optical disk manufacturers are touting as the best technique in an erasable environment, is the phase-change method. This procedure uses a laser to alter the condition of the disk platter's coating from an amorphous to a crystalline state. The two states can then be translated into digital ones and zeros, the report said. The advantage is the states can be altered by the user.

Perhaps the most obvious use for optical storage products is for archival storage — the type of storage many firms are now using micrographics to accomplish. The report noted the current industry trend is to incorporate micrographics, such as microfilm and microfiche, into other areas of data processing, such as office automation, word processing and electronic mail.

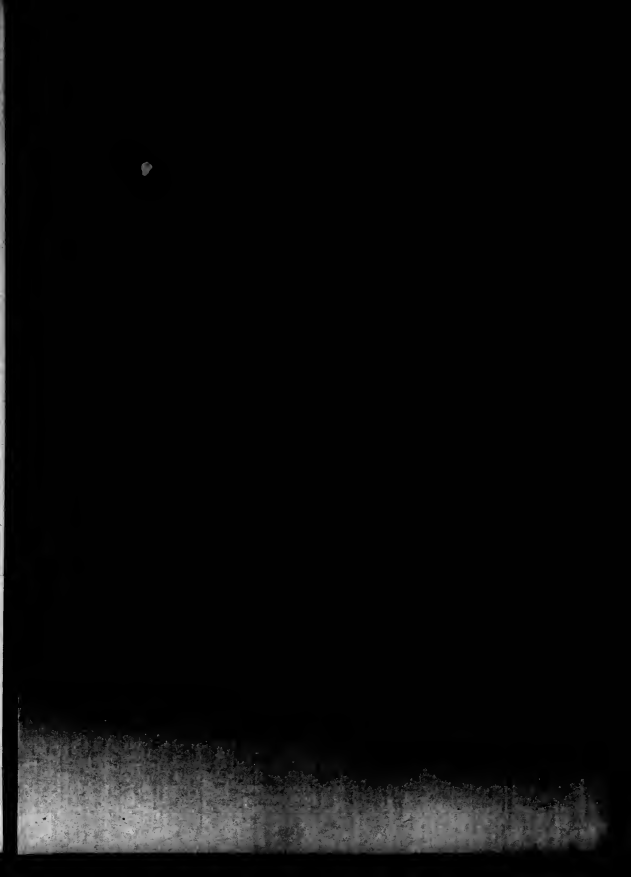
The report concluded that optical storage techniques will probably start to replace micrographics in the early 1990s, with initial units offering a combination of micrographics and optical recording capabilities. But the report was quick to add that micrographics will probably never become extinct.

IDC contended that micrographics will probably remain a strong contender in the archival storage marketplace because its reliability has been proven, it is relatively inexpensive and it is convenient. The report also noted the archival life of micrographics is up to 10 years. While makers of optical disk drives contend optical disks will last at least as long as micrographics, IDC noted those claims have yet to be proven.

The IDC report is called "Storage Alternatives for the '80s" and costs \$1,500 from the firm, which is located at 5 Speen St., Framingham, Mass. 01701.

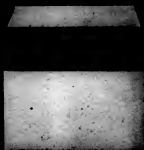








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is available in a variety of sizes...  
flexible growth options...  
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# 3B20S

The 3B20S computer is the first member of the 3B family. It runs UNIX System V and is designed to meet the rigorous needs of data centers, developers, office service organizations, and manufacturing locations.

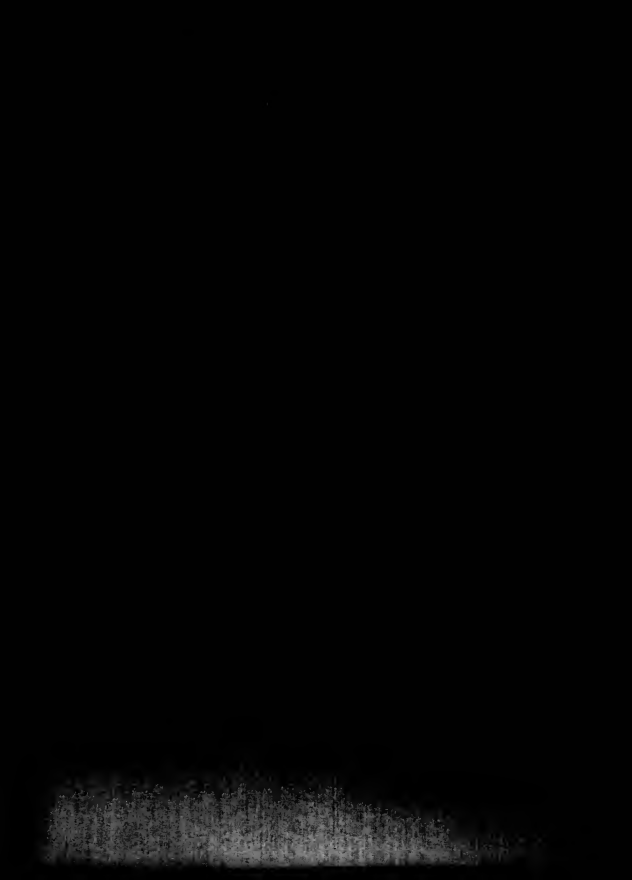
When a customer outgrows these capabilities, you simply add the attached processor forming 3B20A. And add up to 80% to your performance rate. Or you can begin serving your needs with 3B20S from the start.

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Like the best  
not require us  
For I have  
passed in its



# MICROCOMPUTERS



## Olivetti's micros draw attention

The two Olivetti Corp. micros shown here were standouts among the IBM Personal Computer-compatible micros displayed at this month's Hannover Trade Fair. The machines drew special attention because of their potential as OEM products for AT&T, which plans to buy 35% of Olivetti. The Italian manufacturer acknowledged that talks with AT&T about supplying one or both machines have taken place, although no deal has been announced.

Olivetti's new M24 is built around an Intel Corp. 8086 chip, with a socket for an optional 8087 coprocessor. The system features 128K bytes of random-access memory, expandable to 640K bytes, Olivetti said. The M24 includes either one or two minifloppy drives, with either 360K or 720K bytes each, or one floppy and a 10M-byte hard disk.

The M24 supports Microsoft, Inc.'s MS-DOS, Digital Research, Inc.'s Concurrent CP/M 86, the UCSD P-system and Olivetti's proprietary Posix operating system. A 12-in., high-resolution display (monochrome or color), serial port and parallel port are standard. Options include up to seven expansion slots, Ethernet or Corvus Systems, Inc.'s Omninet local-area network boards and a Zilog.

See OLIVETTI page 80



Olivetti's M24 personal computer



Olivetti's M21 transportable micro

## CDC offers micro maintenance

Promises fast service for IBM Personal Computers

By Paul Kananavich  
City Staff

MINNETONKA, Minn. — Control Data Corp. has entered the microcomputer service business with Backup, a maintenance program for IBM Personal Computers and Personal Computer XT's, said to replace defective equipment within four hours of a call.

"IBM Personal Computer users are professionals who do not want pieces of the machine spread across their desk," said Daryl Olsen, CDC's marketing manager for microcomputer services. "They want a new machine, so we supply it and take the defective machine to our service office for repairs."

"Sixty percent of IBM Personal Computer users do not have a service policy," Olsen said. "We see service as a huge untapped market." Service contracts can simplify logistics at large corporations, which do not have to stock replacement Personal Computers or implement corporate service policies, he claimed.

CDC currently has 14 service centers in major metropolitan areas and plans to expand to 40 centers by year's end, Olsen said. The four-hour service is available

only to customers within 50 miles of a center. For other areas, CDC offers 24-hour exchange service. "We will ship the user a new system as soon as we receive a defective one."

Backup is available in two pricing structures: fixed fee or flexible fee. Fixed-fee pricing costs \$645 a year; an annual flexible fee costs a minimum of \$304 and a maximum of \$678. Large users will receive volume discounts.

Backup services IBM microcomputers and selected peripherals from companies such as Amdek Corp.; Corona Data Systems, Inc.; Corvus Systems, Inc.; Davong Systems, Inc.; Epson America, Inc.; NEC America, Inc.; and Quate Corp. "We can't service every machine on the market, but we do support popular products," Olsen said.

CDC plans to expand its service line. "The 8070 Personal Computer will probably be the next item added to the service plan," Olsen predicted. "When the IBM Portable [Personal] Computer and PCjr reach volume shipments, they may also be added."

CDC is located at 5720 Smetana Drive, Minnetonka, Minn. 55343.

## Eagle 1600 replacement debuts

LOS GATOS, Calif. — Eagle Computer, Inc. has replaced its high-end IBM Personal Computer-compatible Eagle 1600 with the new Eagle Turbo XL, which the company said offers a lower price, dual processing speeds and the ability to act as a network file server.

Eagle claims that the Turbo XL runs IBM Personal Computer software including Lotus Development Corp.'s Lotus 1-2-3 and Microsoft, Inc.'s Flight Simulator. "Since we use a faster processor, programs will run two times faster on our machine than on the IBM Personal Computer," said Ronald Petersen, vice-president of product planning. "Turbo XL is designed for users requiring a high-performance microcomputer."

Turbo XL is based on an Intel Corp.

8086 microprocessor and costs \$4,995 without a monitor. The system features 256K bytes of random-access memory (expandable to 512K bytes), five expansion slots, a 10M-byte hard disk drive and a toggle switch that allows the user to switch from 8-MHz to 4.77-MHz processing speeds, Petersen said. "Users may want to slow the machine for scrolling or game playing," he noted.

The microcomputer can act as a network file server for Easynet (the company's local-area network, based on a Nestor Systems, Inc. implementation of Datapoint Corp.'s Arcnet), connecting up to 10 Eagle microcomputers. A network starter kit is priced at \$1,995, and each microcomputer adapter costs \$695.

See EAGLE page 80

## Food wholesalers reduce costs using micros, time-sharing network

By Robert Bott  
City West Coast Bureau

CHICAGO — In an attempt to slash transportation costs, the National-American Wholesale Grocers Association (Nawga), is sponsoring a two-month computer pilot project here that will coordinate distribution activities for some of the nation's leading food wholesalers.

Using IBM Personal Computers connected to the General Electric Co. Mark III telecommunications time-sharing network, Nawga has set up its Backhaul Clearinghouse system linking 26 food distributors in the Midwest. Cities covered by the network include Chicago, Milwaukee and Minneapolis.

The wholesalers will use the Personal Computers to update their distribution schedules on the network, advertise their

transportation needs or availability and coordinate their distribution much more effectively, Nawga claimed.

### Dealing with empty trucks

Food distributors often send out empty trucks to pick up commodities located hundreds of miles away, according to Richard Coyne, Nawga's director of task force services. On many occasions, he asserted, the cargo is a fraction of the truck's holding capacity, further adding to the waste of time, manpower and equipment.

One frozen foods distributor, whose 20 trucks pick up goods from 85 suppliers and service 3,000 customers, will save some \$4,000 a week by joining the Backhaul network and sharing its resources, Nawga estimated.

See TRUCKS page 80

## INSIDE

Systems/84  
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## MICRO-COMPUTERS

## Shugart announces minifloppy

SUNNYVALE, Calif. — Shugart Associates, Inc. has introduced a 5¼-in. minifloppy said to offer the same performance and recording capabilities as the company's 8-in. disk drives.

The new Shugart 475 features a double-sided drive with 1.6M bytes of storage, a data transfer rate of 500K bit/sec, a track-to-track access time of 3 msec, 96 track/in. density and the ability to read data written on media of 45 track/in., the vendor said.

The minifloppy uses the same recording format as standard 5¼-in. floppy disk drives and runs on a standard 5¼-in. floppy disk drive controller,

Shugart said.

The 475's printed-circuit board includes large-scale integration circuitry and a 4-bit microprocessor to handle the read channel, write channel and motor control electronics, the vendor said. The read/write head is positioned with a stepper motor/hand actuator system, and a vertical clamping mechanism helps reduce positioning errors, according to Shugart.

The 475 costs approximately \$200 in OEM quantities.

More information is available from Shugart, which is located at 475 Oakwood Pkwy., Sunnyvale, Calif. 94066.

## SYSTEMS

CHALLENGE SYSTEMS, INC.  
Translating Word Processor

Challenge Systems, Inc. has announced the Translating Word Processor, a desktop computer designed for Spanish/English translation.

Some of the product features include: automatic bidirectional translation; multilingual text editing; a 25,000-word general dictionary in both languages, which includes idioms and expressions; and automatic backup storage on a removable cartridge, according to a company spokesman.

The central processing component contains dual 8086, Inc. 286 microprocessors with 256K bytes of main

storage. It is packaged with a built-in, battery-backed clock and a 1M-byte, 5-1/4-in. floppy disk drive.

Its price is \$25,000.  
Challenge Systems, 1800 Commerce Drive, Richardson, Texas 75081.

## LINKDATA, INC.

Mini System 3000 with Dibel operating

Linkdata, Inc. has introduced a minisystem IBM System 3000 microcomputer system that reportedly can use Digital Equipment Corp.'s Dibel business application software.

The vendor's UNI-DOS operating system is said to allow the IBM System 3000 microcomputer to run all Dibel software. The vendor's programming language is source-to-source-compatible with Dibel, and UNI-DOS emulates DEC's CTS-800 and CTS-500 operating systems, according to a vendor spokesman.

A basic configuration, priced at \$15,500, consists of a CPU, one CRT terminal with three expansion ports, a 25M-byte Winchester disk drive (with 5M bytes removable and 20M bytes fixed) and 256K bytes of main memory.

Linkdata, 2005 Rt. 22, Union, N.J. 07083.

SCIENTIFIC MICRO  
SYSTEMS, INC.

SMS 1000 Model 40

Scientific Micro Systems, Inc. (SMS) has introduced a microcomputer system that reportedly is fully compatible with Digital Equipment Corp. systems.

The SMS 1000 Model 40 will run, without modification, all system and application software developed for DEC's LS-11/33 and LS-11/73 CPUs, according to the vendor.

The Model 40 is a Q-bus-compatible, Winchester-disk-based system available in a variety of configurations, a spokesman said. All versions are based on the vendor's SMS Foundation Architecture and include a system enclosure, choice of fixed and removable peripherals, LS-11 processor and memory.

A Foundation Module, the hardware implementation of the SMS Foundation Architecture, reportedly integrates the main storage device controller, two serial communication ports, all backplane circuitry and the support monitor subsystem on a single board, without requiring any of the backplane slots, the vendor said.

Prices for the Model 40 start at \$5,990 for a configuration consisting of a Foundation Module with two serial ports; a 12M-byte Winchester disk; a 6¼-in., 800K-byte floppy disk; an LS-11/73 CPU; and 256K bytes of main memory in floor-stand or rack-mount rack.

Scientific Micro Systems, 777 E. Middlefield Road, Mountain View, Calif. 94043.

## IAX CORP.

In-circuit emulators

IAX Corp. has announced a series of in-circuit emulators designed to convert the IBM Personal Computer into a software and hardware development system for non-IBM systems.

The IAX KCD-178 08000 is a stand-alone system said to emulate the Motorola, Inc. 68000 family of microprocessors. Running to 10 MHz, it

Continued on page 86

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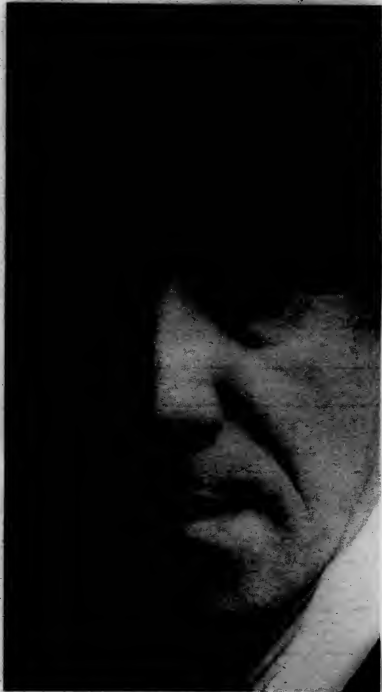
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## MICROCOMPUTERS

Continued from page 84  
reportedly features 128K bytes of emulation memory, expandable to 256K bytes. The system costs \$7,995.

The Sax KCD-578 8008 is designed to emulate the Intel, Inc. 8008 microprocessor. Running at 8 MHz, it is said to feature 64K bytes of mappable memory, an in-line assembler and displays in hexadecimal/ASCII or disassembled code. The system is priced at \$4,995.

The Sax KCD 178 8048 is said to emulate the Intel Corp. 8048 family of microprocessors in one unit to 11 MHz. It features 4K bytes of emulation memory and is priced at \$4,995.

Software designed to work with the emulators is available at prices ranging from \$450 to \$1,350.

Sax, 2572 White Road, Irvine, Calif. 92714.

## PRINTERS/PLOTTERS PERIPHERALS

AMDEK CORP.  
9696 series printer

Amdtek Corp. has unveiled the 9696 series of letter-quality printers, featuring daisy-wheel printing and providing up to 128 char. on a single wheel and a variety of typefaces.

The three printers are the 9625, a transportable 25 char./sec printer; the 9640, a desktop 40 char./sec printer; and the 9655, a desktop 55 char./sec printer.

Prices are \$799 for the 9625, \$1,675 for the 9640 and \$1,900 for the 9655.

Amdtek, 2801 Lively Blvd., Elk Grove Village, Ill. 60007.

NORTH ATLANTIC INDUSTRIES, INC.  
Model 7065

North Atlantic Industries, Inc. has released Model 7065, a multimode printer.

The printer stores 40 letter-quality fonts on-line, the vendor said. The printer features automatic proportional spacing and justification, fiction feed, tractor feed and automatic bold, repeat and underline capabilities, according to the vendor.

The Model 7065 prints at speeds varying from 65 to 360 char./sec and in near-letter-quality, letter-quality and graphics modes, according to the vendor.

Model 7065 costs \$1,995.  
North Atlantic Industries, 60 Plant Ave., Hempstead, N.Y. 11788.

## DATAPORT

Letter-quality printer

Dataport has announced a letter-quality printer said to weigh five pounds.

The printer has an elite 12-char. font, a Centronics Data Computer Corp. parallel port and a surge suppressor. It reportedly prints 16 char./sec.

The printer supports bidirectional printing, an 80-cel. width and the Ascii 96-char. set, according to the vendor. Dataport claims that mean time between failures is more than 16.5 million characters and mean time of repair is 15 minutes.

The printer costs \$395.  
Dataport, Building A, 5585 Olinda Road, El Sobrante, Calif. 94803.

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## AUXILIARY EQUIPMENT

VOTAN, INC.  
VFC 5000

Votan, Inc. has introduced the VFC 5000, a voice card that provides voice recognition, speech generation and telephone management capabilities in one package for the IBM Personal Computer.

VFC 5000 software is said to let the user incorporate voice input capabilities into existing software packages without any modification to the application software itself.

The VFC 5000 printed-circuit board plugs into any of the long auxiliary system bus slots on the IBM Personal Computer, Votan said. The microphone, speaker, software and documentation reportedly are included on the board.

Available late this month, the product is priced at \$2,400.

Votan, 4437 Technology Drive, Fremont, Calif. 94538.

STAFF COMPUTER TECHNOLOGY CORP.  
The Key

Staff Computer Technology Corp. has introduced a high-security version of The Key, a hardware and software package that protects software from unauthorized access.

A user can choose from 24 qualification (24 times 10<sup>14</sup>) different inquiry and response pairs, according to a spokesman for the vendor. The great number of different pairs reportedly allows the user to choose a unique code for each software package.

The Key is available for Apple Computer, Inc.'s Apple II and IBM's Personal Computer and Personal Computer XT.

The product is priced at \$155.  
Staff Computer, Suite J, 10457 Roselle St., San Diego, Calif. 92121.

## SOFTWARE

NEC INFORMATION SYSTEMS, INC.  
Analyst, Executive, Programmer, Designer

NEC Information Systems, Inc. has announced four graphics software packages for its Advanced Personal Computer (APC) microcomputer.

The systems, dubbed the Analyst, the Executive, the Programmer and the Designer, are priced at \$1,995 each.

Continued on page 86

# If you think four IBM screen sizes on one display is news, you're right. But three years late.

With IBM's announcement of the new 3180 display, one fact remains. Lee Data has been delivering "the wave of the future" displays for more than three years. The Lee Data All-In-One Display.

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## MICROCOMPUTERS

Continued from page 96

Designer, each contain a graphics package, an APC graphics subsystem board and 128K bytes of random-access memory.

The Analyst is said to be an integrated spreadsheet system that allows users to enter and manipulate data and create bar, line or pie charts on the monitor or in hard copy.

The Executive system integrates data base, spreadsheet, graphics, word processing, forms creation and telecommunications into a single package that allows a user to retrieve information and present it graphically. The Presenter package comes in two versions; one of which is screen-oriented for producing slide presentations, the other plotter-oriented for producing paper copies and overhead transparencies.

NEC's Designer computer-aided design system is intended for architects, structural engineers and electrical engineers.

The graphics packages cost \$648 each for monochrome versions and \$696 each for color versions.

NEC Information Systems, 1414 Massachusetts Ave., Boston, Mass. 02118.

## VALLEY SYSTEMS, INC.

## Conversion Aid

Valley Systems, Inc. has announced Conversion Aid, a software package that allows files from IBM System/34 and System/36 minicomputers to be used by microcomputer application packages such as Lotus Development Corp.'s Lotus 1-2-3.

Conversion Aid selectively accesses fields and records from System/34 or System/36 files and allows the user to modify the selection at execution time, the vendor said. Files can then be downloaded to 54-in. diskettes, according to the vendor.

Conversion Aid costs \$360. Valley Systems, 4407 W. Grinnell, Phoenix, Ariz. 85021.

## SOFTWARE RESEARCH TECHNOLOGIES, INC.

## Smartway II Plus

Software Research Technologies, Inc. has introduced Smartway II Plus, a software utility for the IBM Personal Computer that cuts repetitive keystrokes.

Users can reportedly assign a series of characters or commands to any key. Extensive commands, bold-escape text and repetitive functions can be entered by a single keystroke, the vendor said.

Smartway II Plus costs \$59.95.

Software Research Technologies, Suite 211, 3757 Wilshire Blvd., Los Angeles, Calif. 90010.

## SOLVATON, INC.

## Manufacturing Planning and Control System

Solvaton, Inc. has announced the Manufacturing Planning and Control System for use with its Series 7000 midrange microcomputer.

The system consists of six interactive modules: inventory, bill of materials, purchasing, order processing, production planning and word processing. It is designed to control manufacturing processes for small manufacturing companies.

The modules are priced between \$650 and \$1,500.

Solvaton, 150 Flanders Road, Randolph, Mass. 01551.

## DATAMATE CO.

## Pastfile

Datamate Co. has introduced Pastfile, a personal data base system for IBM Personal Computers and compatibles.

Pastfile is a specialized version of Datamate's English-language report writer, Bequery, that allows the user to print or display custom reports whenever needed.

The program is available for Microsoft, Inc.'s MS-DOS and IBM's PC-DOS 1.1 and 2.0. It requires 128K bytes of storage and a monochrome or color monitor, according to a spokesman for the vendor.

Pastfile is priced at \$465, the vendor said.

Datamate, Suite 128, 4185 S. 100th East Ave., Tulsa, Okla. 74146.

## DIGITAL INFORMATION

## SYSTEMS CORP.

## Enhanced DBL

Digital Information Systems Corp. has enhanced DBL, its business programming language.

DBL has been rewritten in C and runs on Hewlett-Packard Co.'s HP 150, IBM's Personal Computer, Data General Corp.'s Model 10, Wang Laboratories, Inc.'s Professional Computer and Digital Equipment Corp.'s Rainbow.

DBL is a subset of DEC's Dblol-11 and is up to 100% compatible with DEC's Dblol 83, the vendor said.

DBL is priced at \$490, the vendor said.

Digital Information Systems, Suite 349, 5536 Broadway Road, Sacramento, Calif. 95827.

## TRANSTIME TECHNOLOGIES

## CORP.

## Datamat

TransTime Technologies Corp. has introduced Datamat, a productivity and decision support program.

Datamat creates bar charts and scatter charts, possesses mathematical and statistical functions and is capable of format generation and text processing, the vendor said. The package also includes an application generator, according to TransTime. Datamat is reportedly relational, integrated and menu-driven.

Versions of Datamat run under Unix, Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M.

Prices range from \$300 to \$1,000. TransTime Technologies, 787 Sheridan Drive, Toms River, N.J. 08058.

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**TRUCKS** from page 83

The pilot project, which begins May 1, marks the first occasion food wholesalers have joined together in a computerized distribution network, Coyne said.

**"Start of something big"**

"We regard this pilot project as the start of something big," he maintained. "From this nucleus of 28 wholesalers, we plan to build a nationwide network and have the entire nation on-line in the years ahead," Coyne explained. News has 383 company members throughout the U.S.

The Backhaul system uses a modified version of Quid-Load, a software package from International Data Communications Corp., running on

the Mark III network.

GE paid for the software modification, which cost well in excess of \$100,000, according to a company spokesman.

As part of the pilot project, GE is encouraging wholesalers to use its Mark III network by making it available free of charge for the first two months.

Following that, the wholesalers will be billed on the number of transactions they perform, GE said. To advertise on the network will cost approximately \$3, while a successful match to buy or sell a shipment will cost between \$4 and \$7.50.

For those network users who lack IBM Personal Computers, GE will also offer the micro free of charge for the first month. GE is a major distributor of IBM Personal Computers,

according to Daniels Weigel, the company's manager of transportation marketing.

**Greatest compatibility**

"We felt the Personal Computer would have the greatest receptivity in the wholesalers marketplace, and that is why it was chosen," Weigel said.

Setting up the network "took six weeks of communicating with the chief executives of the 28 companies and holding a meeting of the principals involved before we could launch the pilot," Coyne noted.

The Mark III network's host mainframe processor, a series of Honeywell, Inc. DPS 8 systems, are housed at data processing centers in Cleveland, Rockville, Md., and Amsterdam.

**EAGLE** from page 83

Turbo XL costs \$2,600 less than a comparable 1600 microcomputer, according to Patterson. However, the 1600 features bundled word processing and spreadsheet software, while Turbo XL includes only Microsoft's MS-DOS and Basic.

Eagle plans to ship 500 Turbo XLs this month and 1,500 in each following month.

Also this month, the company cut the price of three products. The cost of the portable Eagle FC Sprint dropped from \$9,995 to \$7,995. The desktop Eagle FC Plus-1 now costs \$2,595, and the FC Plus-2 is offered at \$2,495.

Eagle Computer is headquartered at 903 University Ave., Los Gatos, Calif. 95030.

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\*Requires IBM of memory base on MS-DOS and PC-DOS operating systems.

**OLIVETTI** from page 83

Inc. 28000 alternate processor board, which is required to run Posa.

In addition to stand-alone operation, the M24 can act as an intelligent workstation in distributed data processing environments or integrate into IBM S/370 terminal networks, Olivetti said. The system is available now in Europe, with prices starting at about \$3,300, according to a spokesman.

Olivetti's new M21, a transportable version of the M24 weighing 30 lb, features a 9-in. display and houses either one or two floppy disk drives. The system also connects to an external 10MB-byte hard disk drive. European shipments will begin in September. Pricing was not released.

In addition to the agreement under which AT&T will buy 35% of Olivetti, a recent contract calls for the European manufacturer to supply AT&T with \$250 million worth of computer workstations.

Meanwhile, Decibel/Olivetti Corp. in Irving, Texas, will evaluate the new machines as possible additions to the line of personal computers Decibel markets in the U.S.

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# COMPUTER INDUSTRY



**INDUSTRY INSIGHT**  
Power Byrick  
On New Tech

## Stratus matures, looks to future

**S**tratus Computer, Inc., the young upstart cheating Tandem Computers, Inc.'s dominance of the fault-tolerance processor market, took one big step in the growing-up process last week and seems intent on taking perhaps an even bigger step soon.

By offering two new models of its hardware-based fault-tolerant concept, the company increases its attractiveness to what seems to be a rapidly increasing market.

By the end of this year, at the earliest, the company plans to adopt a Unix-compatible operating system that should go a long way in minimizing the company's major shortcoming—a lack of third-party applications software.

The selection of Motorola, Inc.'s 68000 chip for the original Stratus/32, now called the FT 300, may be a crucial factor in Stratus' fortunes. The 68000 seems to be the chip of choice for Unix-based systems, and Motorola claims to have designed it with future enhancements in mind. In the two recent releases, Stratus uses the next chip in line, the 68010.

Given the growing interest in Unix, and the possibility that Apple Computer, Inc. may make the 68000 family a standard to compete against Intel Corp. products, Stratus may have the potential to become a very desirable product in many settings that require a processor standing between IBM mainframes and networked microcomputers.

While ideal for banking and stock house transactions, Stratus computers are presently also in use in retail, manufacturing, services, scientific and distribution environments, including an automated factory being built by none other than Motorola. That type of varied experience at such a young age will serve the

See STRATUS page 104

## Nixdorf notes industrial trend West German entrepreneurs starting to win respect

**WELLESLEY, Mass.**—West Germans lack the entrepreneurial spirit that has characterized U.S. commerce, but both government and established industry have taken steps in the past two years to promote innovation, according to Heinz Nixdorf, founder and chairman of Nixdorf Computer AG.

Speaking recently at Babson College here, where he was inducted into the business school's Academy of Distinguished Entrepreneurs, the West German businessman said his nation's economy traditionally has been dominated by old companies with lucrative and unshakable ties to government.

An example is Siemens AG, a long-established company that practically dominates the government post office's \$7 billion investment portfolio. "You could say [Siemens] invented Germany," Nixdorf said.

But in the past two years, he said, Siemens has attempted to motivate developers to leave the company, offering financing for former employees to start their own companies. Additionally, the government has a program to allocate \$1 billion to small, young companies in an attempt to

spur innovation. Presently, there are more venture capitalists than there are entrepreneurs, he claimed. "It might be too fast, this rate of change; but better too fast than never," Nixdorf said.

Nixdorf started his entrepreneurial career in 1952, after failing to convince a colleague to start a company to develop Nixdorf's idea for a mechanical calculating machine. "He said to me, 'If it's as easy to make as you say, make it yourself,'" Nixdorf recalled.

Funded with \$6,000, he did build the machine for the biggest power utility in West Germany; in 1968 he developed the first desktop calculator with built-in printer, and in the 1960s and 1970s he developed a line of small business computers. Remarking on the success of the microcomputer market, he recalled that in 1966 he developed a small computer priced at \$8,000, but it failed to sell as well as a model priced at \$20,000. Today, the company has reported sales just short of \$1 billion and offers models ranging in price from \$4,000 to \$800,000, all able to use the same software, he said.

See NIXDORF page 104

## AMD, FBI investigate sale of bad chips

By David Glass  
CW Staff

**SUNNYVALE, Calif.**—Advanced Micro Devices, Inc. and federal agents are continuing investigations into the sale of defective semiconductor chips that may have been routed through the Far East before purchase by Wyle Laboratories, Inc.

Wyle said it has fired two employees in connection with the incident, and Advanced Micro Devices said it is investigating the possibility of involvement by one or more of its own employees.

Morame Technology, Inc. of Canoga Park, Calif., a distribution company that said it sold the chips to Wyle, claimed the chips were obtained from a Hong Kong-

based company, Super Spark Ignition Systems. The Hong Kong company informed Morame in a telex message on April 8 that the chips were obtained "through official channels in Singapore," according to Jeffrey Brodey, an attorney for Morame.

A spokesman at the San Francisco office of the Federal Bureau of Investigation said the probe is continuing, and there have been no indictments yet. He declined to say whether the investigation has extended to the Far East.

The problem was discovered in March when a Digital Equipment Corp. facility in Phoenix returned a number of defective 64K-byte and 128K-byte erasable pro-

See AMD page 104



Allen Michels, president and chief executive officer of Convergent Technologies, Inc., discussed "appeal management," or how to avoid getting investigation while munching up a healthy share of the market/87

■ A Japanese government agency failed to meet a deadline for proposed recommendations on a controversial software protection bill, but American observers aren't convinced the issue is dead yet/82

■ Intel Corp. and NCR Corp. posted record first-quarter profits and revenues, but Raim Corp., despite a 41% increase in revenues, posted lower earnings per share than last year/84

■ Compaq Computer Corp. has reorganized in preparation for broadening its product base and has established a telecommunications subsidiary/88

# A Simon Legree for Computers

Lotus Ball Computer

## COMPUTER INDUSTRY

# Japan buries copyright bill; U.S. fears it may resurface

By John Hilsinger  
CIS Washington Bureau

WASHINGTON, D.C. — The Japanese government has failed to propose legislative recommendations on a controversial new form of software protection in that country, but U.S. government and business officials who have opposed the plan fear it may resurface at a future date.

The issue concerns a plan by the Japanese Ministry of Trade and Industry (MITI) to replace software copyright with a new, patent-like protection, reducing coverage to only 18 years and allowing for mandatory licensing in certain instances.

The plan, along with a proposal to limit foreign ownership in Japanese value-added networks, has been strongly opposed by U.S. industry with the support of U.S. trade officials. The two groups have begun deliberations on possible forms of retaliation against the proposals (CW, March 26).

In addition, the Japanese education ministry, which has jurisdiction over copyright in that country, also opposed the MITI software plan. Faced with U.S. opposition and the lack of a unified Japanese government position, MITI released a March 27 deadline to present to the Diet, the Japanese parliament, legislation to restructure the software protection law.

## Eliminates ownership provision

The value-added network proposal was modified to eliminate the ownership provision and endorsed by the Japanese cabinet April 6. That plan still would allow MITI to refuse foreign network applicants on certain technical and financial grounds and is still opposed here.

Industry and government officials here expressed relief that the software proposal did not go forward, and some suggested MITI may let plans for the new law die quietly as a

face-saving measure. However, one high-ranking American trade official, who like others involved in this sensitive issue asked to remain anonymous, said, "I do not believe the measure is dead."

"We will continue to be alert to the issue. . . . We have no intention to put it aside," he said, adding: "The fact that a bill has not gone forward to the Diet . . . at this point is no guarantee that a bill will not go forward in the future."

The U.S. will be looking for hard evidence that "the inadequacies and wrongheadedness of the proposal have been recognized and abandoned," he said.

A U.S. electronics industry executive who has been following the controversy closely commented that this is a reprieve, not a permanent victory, although he termed the failure of MITI to propose legislation "very significant" and "at least a temporary victory."

Similarly, Oliver Smoot, executive vice-president of the Computer and Business Equipment Manufacturers Association, which has insisted the MITI proposal violates international copyright treaties that Japan has signed, said the association does not feel confident the issue is resolved. He suggested MITI may be trying to reach a consensus position with the education ministry before submitting a modified software proposal.

Ralph Thomson, American Electronics Association senior vice-president, said, "I am only cautiously optimistic" and predicted continued negotiations on the subject between the two governments.

Not noting the vigor of the U.S. opposition to the MITI proposal and the possibility of strong American retaliation if it goes forward, he added, "I am pleased that there has been a standing back from the precipice [to allow] rational discussion to continue."

# Control Data, Philips announce joint venture in optical recording

NEW YORK — Control Data Corp. and N.V. Philips Gloeilampenfabrieken recently announced here a joint venture to design, manufacture and market optical recording peripherals and associated media.

The two companies and their affiliates previously established cooperative development ventures in 1982 by forming Optical Media Laboratory in the Netherlands and Optical Peripherals Laboratory in Colorado Springs.

The new venture, Optical Storage International, will continue to operate the two development centers and will establish headquarters in Santa Clara, Calif., where optical drives will be manufactured. Media for the drives is expected to be manufactured at a Philips plant in England, officials said.

The Laserdrive 1200 product presently being field-tested, according to CDC spokesman, features a cartridge-mounted 12-in. disk composed of two glass substrates bonded together and

coated on the inside with a metallic layer on which memory will be recorded, or burned, by a beam of light generated by a laser diode. It reportedly will store 10 byte of nonerasable memory on each side, and the drive will incorporate CDC's previously announced Intelligent Standard Interface.

## Philips to own 51%

Philips will own 51% of the partnership, while CDC will own the remaining 49% and will manage the venture. Anil Ahola, currently vice-president of the Santa Clara disk division of Magnetic Peripherals, Inc., a CDC subsidiary, was named chief executive officer of the venture. Ahola previously was vice-president of Computer Peripherals, Inc., a joint venture managed by CDC.

J. H. Caldwell, vice-president of operations for Control Data Peripheral Products Co., said during the New York announcement that the lifetime of the data stored on the op-

tical disk is expected to be greater than 10 years. He said CDC expects optical memory products to represent

10% to 15% of the total computer storage market at the end of the next five years.



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**JULY 2**

**NCC Preview Issue**  
A detailed roundup of the vendors and products to see at the show (complete with booth numbers). Plus we'll take a look at the special attractions in Las Vegas.

*Closes June 15.*



**JULY 9**

**NCC Show Issue**  
We'll highlight Data Pro's yearly hardware survey. Readers always enjoy studying other user's candid ratings of systems and vendors.

*Closes June 22.*



**JULY 29**

**NCC Wrap-up Issue**  
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## COMPUTER INDUSTRY

## Compaq launches subsidiary, European marketing

HOUSTON — Compaq Computer Corp. recently announced the creation of a telecommunications subsidiary, the European introduction of its existing products and the formation of three divisions to develop and market separate families of products.

Compaq Telecommunica-

tions Corp., which will be located in Dallas, will be involved in the development of advanced telecommunications technologies that will be reflected in future products, according to Rod Canon, Compaq president and co-founder.

Canon also announced that the Compaq Portable

and Compaq Plus computers will be introduced to the European market initially by sales through computer specialty stores in West Germany and the UK.

According to Canon, the three divisions created in the reorganization are: the Portable Computer Division, responsible for the Portable

and Plus and headed by Senior Vice-President Jim Eckhart, formerly president and chief executive officer of Prentice Corp.; the Office Computer Division, responsible for development and marketing of products that will provide the company with "a full family of office computers," headed by Vice-President

Kevin Ellington, formerly of Proximity Corp.; and the Advanced Computer Division, responsible for incorporating advanced technologies, headed by Compaq co-founder and Vice-President Jim Harris, with the third co-founder, Bill Murra, named as vice-president of marketing.

## President of Franklin resigns post

PENNSAUKEN, N.J. — Avram C. Miller resigned his position as president and chief operating officer of Franklin Computer Corp. recently, after only 13 months with the company. Franklin also announced it laid off 70 of its 550 employees.

Franklin co-founder R. Barry Borden, chairman and chief executive officer of the company, reportedly will assume Miller's duties.

In a prepared statement, Miller, who joined the firm from Digital Equipment Corp., said his "real interest was in developing a large, broadly based company engaged in microcomputer applications beyond the personal computer industry."

However, "such a framework would simply be unrealistic to impose on Franklin at this time."

Franklin recently started shipping its microcomputers with its own proprietary operating system after agreeing last year to design shipping machines with an operating system that Apple Computer, Inc. claimed was infringing on Apple's copyrights.

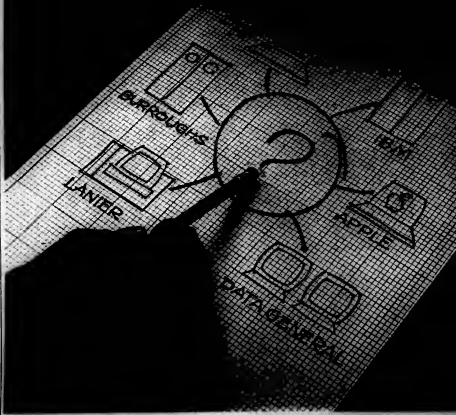
## AMD sales increase 98%

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) reported fourth-quarter revenues of \$192.3 million, up 98% over the same period in fiscal year 1983.

The company reported fourth-quarter earnings of \$30.6 million, or 53 cents a share, up 300% over the same period last year.

Revenues for the year ended March 25 were \$563.3 million, a 63% increase from last year's revenues of \$368.3 million. A net income of \$71.1 million, which included a \$6 million tax credit, was up more than 300% from last year's \$30.9 million.

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## COMPUTER INDUSTRY

# Traffic management skills cited as vital to growth

## Convergent head focuses on direction of rapidly moving firms

By Robert Ratt  
Ch West Coast Bureau

LOS ANGELES — The focus for rapidly moving companies should be on the process of "appetite management," according to Allen Michels, president of Convergent Technologies,

Inc., the Santa Clara, Calif.-based manufacturer of computers and workstations.

In a recent interview here while attending a management conference, Michels, a former manager at Intel Corp. and Digital Equipment Corp., said, "A young com-

pany cannot afford to eat so much that it causes indigestion, because that can lead to serious adverse consequences."

"Rather, a fast-growing divergent computer company, with better than average profits, needs to be skilled in

the art of traffic management."

"It needs to know how fast the industry is moving and in what direction. The trick is to move with the times, but not so fast that you go careening off the road," Michels explained.

Convergent, founded four years ago and regarded in many industry circles as highly successful in producing products for the OEM market, has itself caused some alarm to industry watchers.

That alarm was sounded because of a 23% drop in fourth-quarter profits in 1983 and the prospect of further depressed quarters in 1984.

### Track record debated

Michels defended the company's track record, claiming the company is in a period of transition from being a company with one product — the AWS workstation family — to having a three-product line.

Those three products now include: the much-touted N-Gem workstation, the Megaframe multiuser system and the Workmate portable computer.

But sales of the AWS products accounted for all but about \$10 million of the firm's more than \$180 million sales revenues for 1983, according to the company.

Convergent is expected soon to announce a single processor that is a compatible, low-end companion to Megaframe.

Michels said 1983 was a year of heavy investment in new products for Convergent, with \$13 million being taken away from profits because of product diversification.

He predicted, "1984 will be the year when these investments pay off."

### OEM supplier

Michels said Convergent would remain primarily an OEM supplier, despite its recent deal with AT&T Information Systems, Inc., in which the company agreed to design, develop and manufacture microprocessor-based systems exclusively for AT&T to market.

"We have no plans to become an end-user supplier. Rather, we are trusting the agreement with AT&T as a long-term market arrangement," Michels commented.

The chief executive said that, within the U.S., Convergent's toughest competition is often its own customers, who buy the company's products and ship them with value-added software.

"This places on us a responsibility to be agile, innovative in product development and to seek economies of scale in manufacturing. We are a product company, and our success will be through quality products brought to market early and at competitive prices," he concluded.

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## COMPUTER INDUSTRY

## MSA's Graves foresees rise in firm's revenues for 1984

By Edward Wimmer  
On Staff

**BOSTON** — The largest U.S. software supplier, Atlanta-based Management Science America, Inc. (MSA), expects this to be a much better year than 1983, when the firm's stock price took what MSA's president, Bill Graves, recently called a "roller coaster ride," and net income rose only 30% to \$10.8 million.

According to data presented by Graves to a group of securities analysts here, MSA's net income will grow to \$18 million, a boost of 67%. The firm is also expecting its operating revenues to rise 34% this year, from \$139.1 million to \$187 million.

One income source the firm feels is lagging, though, is foreign software sales, which only climbed 38% to \$29.2 million in 1983 because, Graves said, the firm was "not closing business in some markets where we should have closed more business." Foreign sales accounted for 21% of the firm's total sales last year.

Graves said it was in the foreign market for mainframe software that MSA did the work. In the foreign microcomputer software market, the firm had less cause for complaint, with an increase in revenues of 60%, from \$2.9 to \$4.9 million, in 1983. MSA is predicting foreign microcomputer software sales to rise 43% to \$7

million this year.

He admitted that his firm's revenue is highly seasonal because the majority of its business is in mainframe software, where most business is closed in the fourth quarter. But, he said he looks to the company's growing involvement in microcomputer software, which is much less seasonal, as a way to offset this trend.

Last year, the company acquired Edware, a California educational software firm, and Graves said, "We really see the micro business as being very involved with educational software." In 1983, microcomputer software sales only accounted for 16% of

the firm's \$139.1 million revenue.

Most of MSA's 1983 revenue came from mainframe software (\$117.4 million), mostly for applications in finance and manufacturing. Yet, the firm has no systems software, such as a data base management system (DBMS) in its line.

Graves claimed the lack of a DBMS was no handicap to his firm because "you can buy our general ledger operation under IBM or Cullinet Software, Inc.'s data base." This, he argued, gives the MSA line greater flexibility. Systems software, he said, "is not dramatically material to being in the application software business."

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Mainframe Computer Model

## COMPUTER INDUSTRY

## DPMA appoints Sheehy as its manager of governmental affairs

PARKRIDGE, Ill. — The Data Processing Management Association (DPMA) has named Thomas Sheehy as its manager of governmental affairs.

Sheehy will be responsible for coordinating activities of the DPMA legislative network and reporting on legislative developments affecting information processing at all govern-

mental levels.

Sheehy has been a staff research assistant for the Illinois Senate Minority, client services director for a contract lobbyist and editor of legislative publications for the Illinois State Chamber of Commerce. She is said to have nearly seven years experience in legislative and regulatory activities. She is a graduate of Sangamon State University and is studying there toward a master's degree in public administration.

Sheehy is a member of the Association of Public Administrators and Women in Communications, Inc.

## Zilog to manufacture, market NEC's V series microprocessors

MOUNTAIN VIEW, Calif. — Nippon Electric Co., Ltd. (NEC) announced here recently the signing of a license agreement granting Zilog, Inc. nonexclusive rights to worldwide manufacture and marketing of NEC's V series 8-, 16- and 32-bit microprocessors and peripherals.

The agreement follows an earlier agreement [CW, March 10] granting NEC semiconductor manufacture and marketing rights to Zilog's Z80,000 32-bit microprocessor.

Both agreements follow a resolution of charges and countercharges filed in federal court and later before

the International Trade Commission [CW, Aug. 8, 1983].

Import, infringement charges

Zilog, a subsidiary of Exxon Corp., had charged two NEC subsidiaries with importing microcomputers with circuits copied from Zilog's Z80.

NEC had charged Zilog with patent infringement.

Under the terms of the latest agreement, Zilog will manufacture and market seven Cmos microprocessors, a floppy disk controller, a graphic display controller and an image pipelined processor.

## Tandy profits, earnings rise in third quarter

FORT WORTH, Texas — Tandy Corp. reported last week a 9% increase in profits and an 11% increase in sales revenues for the third quarter ended March 31, in comparison to the third quarter of 1983.

Tandy reported profits of \$62.5 million, or 60 cents per share, up from \$57.3 million, or 56 cents per share, a year earlier. Tandy posted revenues of \$666.1 million, up from \$659.8 million.

In an offer dated April 5, Tandy is seeking to purchase from 10 million to 15 million shares of the 109.9 million shares of common stock presently outstanding. The company offered to pay \$36.50 per share in cash with the offer expiring April 27.

## Apple reports second-quarter profits drop

CUPERTINO, Calif. — Claiming to be "exactly where we said we would be," Apple Computer, Inc. last week announced profits for the second quarter ended March 30 of \$6.1 million, or 15 cents per share, in comparison to the \$23.8 million, or 40 cents per share, reported in the comparable quarter last year.

John Sculley, chief executive officer of Apple, noted the company had announced last November that profits for the first two quarters of 1984 would be lower than in the first two quarters of 1983.

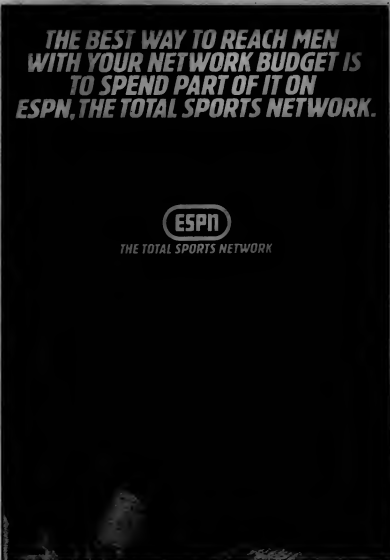
Apple's revenues for the second quarter were \$300.1 million, a 32% increase over the \$228 million that was reported in the comparable quarter a year earlier, and the second-quarter profit was up from the \$5.8 million reported in the first quarter of this year.



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## COMPUTER INDUSTRY

# Arthur Little wins three-year, \$3.4 million DOD contract

CAMBRIDGE, Mass. — Arthur D. Little, Inc., the multinational management and technology consulting firm, has been awarded a three-year, \$3.4 million contract by the U.S. Department of Defense (DOD) to evaluate the agency's automated medical information systems.

The contract is part of a continuing billion-dollar information systems automation program under the

supplies of DOD's Tri-Service Medical Information Systems (TSMIS) program office. The program, which began in 1976, was established to develop standardized, efficient and effective health care information and delivery systems incorporating the latest technologies for the U.S. armed forces hospitals.

Under the contract, Arthur D. Little health care specialists will ana-

lyze the costs and benefits of implementing various hospital information systems. According to project leader Eric L. Dranssen, the team will monitor and evaluate the automated systems to determine that DOD hospitals are fully utilizing those systems.

Results of the evaluation, which will be made available to the public, will provide the most comprehensive information to date about the costs

and benefits of using such systems, according to an Arthur D. Little spokesman.

DOD's health care system provides care to some nine million active and retired department personnel and their dependents. The health care network costs some \$4 billion annually and includes 160 hospitals and more than 400 clinics in the U.S. alone.



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Interleaf, Inc. announced receiving a credit line of \$5.3 million from the First National Bank of Boston. The credit facility will add to Interleaf's working capital for sustaining the company's growth.

Softech, Inc. has reported a 34% increase in revenue for the third quarter ended February 1984. Net income was \$300,000, or 9 cents per share, in the third quarter, compared with \$619,000, or 15 cents per share, in third-quarter 1983.

The MacNeal-Schwendler Corp. has reported revenues for the year ended Jan. 31 totaled \$11.5 million, an increase of 28% over the \$9.2 million reported for 1983. Net income

was \$2.5 million, an increase of 43% from 1983. Net income per share was 45 cents, an increase of 32% over 1983. Revenues for the fourth quarter ended Jan. 31 totaled \$3.6 million, an increase of 36% over last year.

Seeg Technology, Inc. reported sales of \$8.5 million for its second quarter ended March 31, an increase of 70% over first-quarter revenues. The company reported a net loss of \$1.4 million, or 10 cents per share, for the second quarter, compared with a net loss of \$4.3 million, or 38 cents per share, in the first quarter.

VLSI Technology, Inc. reported first-quarter revenues of \$14.2 million, up 86% from a year ago. Net income rose to \$1.5 million, or 7 cents per share, from a net loss of \$1.6 million, or 10 cents per share, in 1983.

LSI Logic Corp. announced revenues for the first quarter of 1984

were \$14.4 million, a 160% increase over first-quarter 1983 revenues. Net income for the first quarter of 1984 was \$3.5 million, or 14 cents per share, a 363% increase.

Silliconix, Inc. reported its net income for the first quarter of 1984 was \$1.6 million, more than five times the \$296,000 reported for the corresponding period a year earlier. Sales jumped to \$19.7 million, a 38% increase from 1983.

BEW, Inc. reported a loss of \$346,014 on revenues of \$2.9 million during its second fiscal quarter ended March 31. For the corresponding period in 1983, the company reported

a net income of \$227,639 on revenues of \$729,565.

Automatix, Inc. reported a 1983 loss of \$2 million on record sales of \$13 million. This compares with a net loss of \$459,000 for the previous year on sales of \$8 million. The company has restated sales and earnings for the prior quarters of 1983.

Cipher Data Products, Inc. reported net income for the fiscal third quarter ended March 31 increased 122% from the year-earlier third quarter to \$3.1 million. Revenues increased more than 56% to \$30.3 million.



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1984

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### **Added Power, but No Added Effort for Programmers or Users.**

One of the advantages of Stratus' hardware based approach to fault tolerance when it was introduced 2 years ago was that, unlike software based fault tolerant computers, it required no added attention from programmers or users. This is just as true now for the powerful new Stratus XA computers. Even the XA 400 with 4 parallel processors, and the XA 600 with 6 parallel processors, high speed cache memories, and additional hardware instructions require no more effort from developers and

users than the original Stratus/32.

#### **1984, and Beyond.**

The writing is on the wall. Transaction processing in increasing volume will be the order of the day. Meanwhile, hardware based fault tolerance that can deliver continuous processing without loss of performance is

already a necessity, rather than a luxury. No other computer is as prepared to prepare you for the demands of the times as is Stratus.

For more detailed information, please contact your local Stratus sales office, or call Keith Johnson in Massachusetts at (617) 653-1466, or toll-free at 1-800-255-1515.

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## COMPUTER INDUSTRY



## SUPER SHORTS

General Electric Co. and Colson, Inc. announced an agreement to operate a joint venture to serve the market for industrial lasers. The transaction is subject to definitive agreements and actions required for approval. Completion of the venture is expected in April.

Harris Corp.'s Government Systems Sector Division announced plans to open an electronic systems and software center in Orlando, Fla. The facility will be for the design and development of computer-based test and maintenance systems for the checkout of avionics equipment on military aircraft.

Digital Equipment Corp. announced the donation of \$4.5 million in equipment to the University of California at Berkeley computer-aided design and manufacturing (CAD/CAM) center to conduct VLSI design and CAD tool research.

Management Decision Systems, Inc. announced that it has agreed to be a value-added reseller for the IBM 4300 series of mainframe computers.

IBM announced that Para Research, Inc. has been selected to be a value-added reseller for the IBM System/36. The value added will be a group of five accounting programs, valued at approximately \$10,000.

C. Itoh & Co. Ltd. announced a new Waltham, Mass.-based company,

called C. Itoh Digital Products, Inc., to handle the retail distribution business of entry-level computer products and office automation-related products.

Management Assistance, Inc. (MAI), Sorbus Service Division, has signed an agreement with IPL Systems, Inc. to provide nationwide maintenance service for that company's IBM 4590 and IBM 4581 plug-compatible computers marketed as the IPL 4436, 4443, 4445, 4446, 4460 and 4480.

Microelectronics and Computer Technology Corp. (MCC) announced the establishment of an "associates program." The purpose of the program is to provide information about MCC research to companies that are otherwise unable to become full par-

ticipants in the MCC advanced research venture.

Matheson Corp. announced an agreement with VR Information Systems to buy Merlyn-0 gate array application software. The software will provide users with an integrated solution for gate array design, from schematic entry through layout and testing.

Zentec Corp. has laid off 30 employees, 6% of its work force. According to Jeffrey L. Thwaite, president, "We are continuing to put plans into place which will enable us to return to profitability."

Control Data Corp. has introduced a new maintenance service for volume users of the IBM Personal Computer and Personal Computer XT that includes a flexible fee plan.



## MERGERS AND ACQUISITIONS

Control Data Corp., Minneapolis, announced it has acquired a 35% equity interest in Innovative Computer Modeling (ICM), Reston, Va. The investment will reportedly expand CDC's position in engineering graphics software and help ICM establish its market position as a supplier of high-end modeling and visualization software.

Burroughs Corp., Detroit, and Joseph & Cohen Associates, Inc., Anaheim, Calif., announced an agreement under which Joseph & Cohen Associates becomes a freestanding subsidiary of Burroughs.

No terms were announced in the assets acquisition of the privately held company.

Datavision, Inc. announced that Sensormatic Electronics Corp. has an option to purchase 20,436 shares of Datavision's Series B convertible preferred stock for \$3 million. Sensormatic has agreed not to acquire more than a 36% interest in Datavision for an extended period of time.

Datapoint Corp. and Xebec announced the closing of Xebec's acquisition of the assets and business of Datapoint's Sunnyvale, Calif. division.

The transaction reportedly includes cash and notes totaling over \$5 million.

Informatics General Corp., Woodland Hills, Calif., and Matheson Systems Development, a division of Litton Industries, Inc., have signed a letter of intent for Matheson to acquire Informatics' data services operation based in Fairfield, N.J. The transaction is expected to be completed by the end of April.

Banctec, Inc., Dallas, has announced its acquisition of Scan-Data Corp. and the Reader-Sorter Division of Control Data Corp. Banctec has acquired all outstanding shares of common stock (including B & C series) of Scan-Data Corp., as well as the assets of the CDC Reader-Sorter Division.

Banctec has also acquired all of the debt owed to CDC by Scan-Data Corp.

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Applications Software.  
A look at the real issues.  
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Sell **MODEL 204** family of products in designated territory. Coordinate technical consulting personnel. BS/BA or advanced degree preferred. 3-5 years' computer software systems sales experience with excellent presentation/communication skills and solid understanding of IBM environment and marketplace. DBMS background desirable. Positions available in Los Angeles, San Francisco, Pittsburgh, New Jersey, Detroit and Orlando.

### SR. TECHNICAL CONSULTANTS

Pre- and post-sales support of **MODEL 204** including presentations, proposals, trials/benchmarks, analysis of user requirements, customer education and installation. 40% travel. BS/BA or advanced degree preferred. 3-5 years' IBM Systems/Applications experience with heavy emphasis in Operating Systems, Database (IMS, DBMS, ADABAS, etc.) and TP (CICS, VTAM, TCAM, BTAM). Knowledge of database design concepts with hands-on applications experience, marketing orientation, excellent communication/presentation skills. Positions available in Cambridge, MA, Los Angeles, Washington, DC, San Francisco, Pittsburgh, New Jersey, Dallas, Detroit, NYC, and Rochester, NY. International positions also available.

### SR. DATABASE CONSULTANTS

Design and implement **MODEL 204** applications through all phases. May function as team leader and participate in client training. BS/BA or advanced degree preferred. 3-5 years' systems/applications software experience and knowledge of database design concepts. **MODEL 204** experience preferred. Positions available in New Jersey, Houston, Chicago.

### EDUCATIONAL SPECIALISTS

Provide technical support to customers; develop materials and conduct customer education in DC Education Center, on-site or via telephone. Assist in contract consulting/programming. BA/BS (advanced) or DP-related desirable with teaching experience. Knowledge of IBM systems -JCL, programming languages - Cobol, PL1, Assembler, Fortran, DBMS, CICS, TP. Monitor's experience desirable. Positions available in Denver and Washington, DC.

### SR. SOFTWARE ENGINEERS

Design and implement new features for **MODEL 204** including extension to 204 User Language, Distributed 204, and Telecommunications. BS/BA or advanced degree preferred; minimum 3-5 years' programming and at least 2 years' IBM assembly language experience. Product development or large application systems development experience preferred. Knowledge of IBM operating system internals useful. Positions available in Cambridge, MA and Washington, DC.

Send your resume, specifying position of interest to Kathleen Hubbard,  
Dept. CW 42384, Computer Corporation of America,  
4 Cambridge Center, Cambridge, MA 02142.

## Research & Systems

### PROJECT MANAGER

#### CAD/CAM Database Management System

Leadership role for qualified professional to manage a major DBMS effort to develop a central repository for all CAD/CAM data needed during a product life cycle. Requires a minimum of 2 years' experience leading a successful DBMS implementation and design/development of large scale DBMS. CAD/CAM DBMS background a definite plus. Well developed communication skills are essential. MS or Ph.D. in CS preferred.

### SYSTEMS PROGRAMMER

As a team member, the successful candidate will perform systems level design and coding of user interfaces and distributed database management software. Position requires a minimum of 2-5 years' experience with background in database management, user interfaces, and/or UNIX\*. Secret security clearance and BS or MS in CS or equivalent required.

### SYSTEMS PROGRAMMER

Challenging opportunity to implement and test key components of an Ada-based distributed database management system. To qualify, you should possess 1-3 years' experience in large scale systems implementation. Experience with Database/operating systems, QA for large software system, and knowledge of VAX/VMS, Pascal/Ada would be desirable. BS or MS in CS or equivalent required.

### DISTRIBUTED DATABASE MANAGEMENT SYSTEMS

- Project Manager
- Lead Systems Analyst
- Systems Analysts/Programmers

Design, develop and implement a production distributed database capability for an interactive IBM environment with **MODEL 204**. Experience in the design and development of large software systems in an IBM environment is required. Training in DBMS technology and experience using a commercial DBMS is essential. Knowledge of IBM system internals, VTAM, and SNA a plus. BS/MS in CS is preferred.

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## Software Engineers!

### Xerox Has Texas Size Opportunities

Xerox, pioneer in reprographics and innovator in the creation of the office of the future, invites you to join our team in Dallas, Texas—one of the fastest growing high-tech centers in the Southwest. Our Information Products Division has exciting challenges for Software Engineers who want a great place for both their lifestyle and their life's ambition.

TeamXEROX is a collaboration of our proven resources and your resourceful mind. And you can be a part of it. We are seeking professionals with the following credentials:

- \*10+ years product development experience with recent experience on Mini/Micro computers with office automation software.
- \*Must have experience with Assembly language and either PASCAL or C languages.
- \*A BS or MS in Computer Science is highly desirable.

The successful candidates will apply their software development skills in the following areas:

- \*PROFESSIONAL WORKSTATION
- \*ELECTRONIC TYPING
- \*COMMUNICATIONS

Qualified candidates must have U.S. citizenship or be a registered alien.

TeamXEROX in Texas. It's our resources. Your resourceful mind. And a great place for both. Send your resume to: Xerox Corporation, Information Products Division, M5 198, Dept. CW 4-23, 1241 W. Mockingbird Lane, Dallas, TX 75247. Xerox is an affirmative action employer.

# XEROX

## SYSTEMS MANAGER

### Multiple VAX-11/780s

GA Technologies Inc. is a broad based high technology firm located in beautiful San Diego, California.

We have an immediate need for a recognized expert on the DEC VAX/VMS computer and Data Communications software and hardware. Candidates will be responsible for configuring, installing and enhancing all VAX/VMS computer systems software. VAX systems are being used for engineering, business and office automation functions. Duties include developing enhancements to VMS and to office automation software.

Requirements include 5 years experience with at least 3 in configuring, enhancing, and maintaining VAX/VMS software on a multi-user computer system. Proficient BS or MS degree or equivalent work experience.

Please send your resume to GA Technologies Inc., Dept. MS, P.O. Box 96908, San Diego, CA 92136. We are an equal opportunity employer m/f/h/v.



2022 GA Technologies 1984

## DIRECTOR - INFORMATION SYSTEMS

City Utilities is seeking a Director of Information Systems to manage a department of approximately 20 employees and coordinate operations and systems development. Responsibilities include managing the information systems department, developing the city's current requirements for computer equipment and representing the importance of computer and software resources to support the city's existing and future needs.

Qualifications include a BS or MS degree in computer science, business or a related field with 10 years experience in a supervisory position with 3 years experience in a supervisory position with 1 year experience in a supervisory position with 1 year experience in a supervisory position.

Qualified applicants may send resumes to:  
City Utilities  
P.O. Box 85138  
Springfield, MO 65801  
Attn: Carol Lentz  
6205677

## ATTN: IBM TRAINED C.E.'s

HTS needs Customer engineers with IBM training and a minimum of 3-5 years experience in the following locations: Chicago, Pittsburgh, Cleveland, Akron. Exceptional compensation, complete benefits package, travel expense and salary requirements to: Hartford Technical Services 358 Riverside Drive West Gales, IL 60141 1-800-323-6366

## FIELD ENGINEERS

Datserv Computer Maintenance is expanding nationwide. We now have immediate openings in major cities and will be adding more in the near future.

These are key positions and provide excellent opportunities that will lead to further promotion in a fast growing company. Excellent compensation and good fringe benefits for experienced individuals. Your potential for personal advancement with a \$100 million plus company is the greatest right now as we expand.

JACKSONVILLE, FLA - Field Engineer. Immediate opening for experienced Field Engineer for support of IBM 3200 Terminal Equipment.

OMAHA, NE - Field Engineer. Immediate opening for an experienced Field Engineer to service and maintain IBM mainframe equipment, terminals and peripherals.

Datserv will soon have additional opportunities for field engineers and technical specialists in several other major cities throughout the United States. If you are considering a change in employment, contact Datserv for a review of what we have to offer.

For immediate consideration and more information call Toll Free - 800-328-6729 or send your resume to: Ben Williams, Datserv Computer Maintenance, Inc., P.O. Box 3025, Hopkins, MN 55343. We are an equal opportunity employer and all inquiries are considered confidential.

# datserv

## NETWORK ADMINISTRATOR UCSD - La Jolla, California

We are looking for an individual to manage and maintain the UCSD network. The network administrator will have the responsibility for planning and managing the network. The successful candidate will have a BS or MS degree in computer science or a related field. The successful candidate will have 3-5 years experience in network administration. The successful candidate will have a strong knowledge of the UCSD network and the ability to manage and maintain the network. The successful candidate will have a strong knowledge of the UCSD network and the ability to manage and maintain the network.

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San Diego

Staff Personnel Office  
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La Jolla, CA 92093  
UCSD Employee

## SOFTWARE ENGINEERS

COMPUTER AIDED DESIGN  
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If you have at least one year experience in one or more of the above areas, we should like you to join our team. Very attractive salary ranging from the 20s to 40s.

Send your resume to:  
**ROMAC**  
One Albany, NY 12207  
609-422-6544

## DIRECTOR OF PROGRAMMING

We are looking for an individual to manage and maintain the programming department. The successful candidate will have a BS or MS degree in computer science or a related field. The successful candidate will have 3-5 years experience in programming. The successful candidate will have a strong knowledge of the programming department and the ability to manage and maintain the department.

If you are highly motivated, want a real challenge, and desire an exciting environment, we can offer you a unique opportunity. Please send your resume to: ROMAC, One Albany, NY 12207. Equal Opportunity Employer M/F

## COMPUTER INFORMATION SYSTEMS

Department chairperson, permanent position, tenure track. Master's degree required, college teaching experience preferred. To teach CORC, BASIC, Systems Analysis Design and Methods, and related courses. Salary commensurate with qualifications. Send resume, transcript, and references to: Division Coordinator of Administrative and Consumer Services, William Woods College, Fulton, Missouri 63221 CDE

## SOFTWARE PROFESSIONALS TO BEK

LOS ANGELES, CALIFORNIA, almost 5000 people, nationwide, 24 hours a day, 7 days a week, 365 days a year. Software development, systems, support, maintenance, programming, etc. Send resume to: PROFESSIONAL PROFESSIONALS, 2000 N. Main St., Suite 100, Los Angeles, CA 90012. Equal Opportunity Employer M/F



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arrangements without any cost or obligation to you. If you're unable to call, write:

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Mountain View, CA 94039**

**Senior Programmer/Analyst**—Reading Applications, Leading Action Research Initiative needs a professional to assume responsibility for information center definition, planning, scheduling, resource management and final implementation. To \$85,000.

**Systems Analyst**—System S3, Growing manufacturing firm in smaller Arizona community provides a ground-floor opportunity to build a staff and develop the site processing function. Person leading and supervising staff including RPG is desired. Excellent opportunity. To \$85,000.

**Systems Analyst**—New Computer Software, Recently formed subsidiary of a prestigious Fortune 500 corporation seeks an Analyst to assist in the development of its local data processing systems. Solid background in COBOL, structured design techniques and previous system design experience is required. Pleasant location. To \$82,000.

**UNIX Systems Programmer**, Proven talent firm seeks an individual with extensive UNIX software background to assume complete responsibility for system integration, performance, operations and maintenance. Knowledge of microcomputers to be distributed processing environment preferred. To \$85,000.

**Systems Engineer**—Deal Computer Corp., Computer hardware vendor who caters among the leaders in Client/Server Data Communications seeks an Analyst to join its Phoenix office staff. Knowledge of several high level languages, data communications concepts and microcomputers is required. To \$84,000.

**Micro Systems Programmer**, Prestigious computer hardware manufacturer seeks an experienced talent Programmer/Analyst to participate in the development of applications for small business and industries. Extensive Assembly and PASCAL, C++ programming orientation and extensive experience with communications facilities required. Excellent benefits package. To \$85,000.

**Senior RPG and IBM Systems Programmer**, Nationally known IBM Corporation offers challenging position with responsibility for MVS and RPLI environment evaluation, hardware analysis and software development. To \$85,000.

**Systems Analyst**—Distributed Programming, Phoenix area organization seeks a professional to analyze computer operations in otherwise non-operating center locations including transaction TP analysis and control of master file records. To \$85,000.

**RPG3 Programmer**, Growing Arizona organization seeks a professional with solid RPG programming skills to lead all administrative systems. Will consider any experience with COBOL or Assembly language. To \$85,000.

**Programmer**—HP4000, Major Arizona organization is improving the implementation of HP 4000-based distributed information systems. Offers outstanding internal training opportunities in a growing computer industry. To \$85,000.

**Telecommunications Specialist**, Communications firm has multiple projects for micro Programmers and Software Engineers in developing their own communications based systems in micro-computer environments. Will handle live traffic and support multiple communications networks. U.S. & foreign. To \$80,000.

**Systems Analyst**—Distribution or Personnel, Major division of a Fortune 500 corporation seeks an experienced Analyst with at least three years experience to distribute or transfer financial information systems. Large systems environment. Excellent benefits. Arizona location. To \$85,000.

**ALC Programmer/Analyst**, Corporate Data Communications Group of a Fortune-based Fortune 500 company seeks an individual to participate in the development of applications related information systems using VMS, COBOL, BASIC and B. 2023 or under VMS. Company offers extensive travel training. To \$85,000.

**Business Systems Development**, Fast-growing diversified Private company is the financial field seeks an individual to handle staff of business and all head-end development, planning and research. Knowledge of business and microcomputers. To \$85,000 plus bonus and profit sharing.

**Systems Manager**—On-Line Development, Suburban Phoenix corporation offers an exceptional opportunity for a professional with previous programming experience to direct the development of new on-line financial systems. Strong background in computer techniques and financial data analysis. Prior distributed systems experience. To \$85,000.

**Business Programmer**, New Mexico firm seeks aggressive, technically-oriented individuals with expertise in multi-terminal systems and structures. B.S. degree, COBOL, BASIC and C++ programming. To \$85,000, B.S. degree to \$90,000.

**Junior Programmer/Analyst**, Progressive New Mexico CO also offers an excellent opportunity for the placement of a student administrative systems. Will consider any experience with COBOL or Assembly language. To \$85,000.

**Lead Systems Programmer**, Leading New Mexico firm has created a new position resulting expertise in project management, systems development, hardware/software modification and systems testing. JPC/COBOL VMS. To \$85,000.

**Systems Engineer**—Mills, Leading communications firm seeks a Systems Engineer with strong Assembly and data communications experience on DEC PDP or VAX systems. To \$85,000.

**Engineering Analyst**, High technology firm has multiple roles available in Engineering with strong background in Assembly, problem solving, hardware and graphics. Growth in engineering position. To \$85,000.

**Senior Programmer**—Power Business Systems, Leading computer services firm needs Senior Programmer with a minimum of three years computer-oriented skills. Opening due to promotion. Payment To \$85,000.

**Programmer/Analyst**, International Travel, International corporation is in need of an experienced talent in the field of computer systems. Will handle all administrative and financial systems. To \$85,000.

**Systems Analyst**—New Applications Development, National telecommunications corporation, improving a new major telecommunications system, seeks a professional with three years experience in telecommunications business applications. To \$85,000.

**Customer Applications Analyst**—Financial, Denver-based third-party firm is expanding its branch staff and seeks persons with two years of PORTMAN or BASIC experience building engineering or business applications. To \$85,000.

**Systems Programmer**—New Systems Group, Growing Denver suburban firm seeks that RPG Systems Programmer. Will be the first person with an IBM COBOL COBOL Systems background. To \$85,000.

**Programmer/Analyst**—New IBM Development, Replacement of a major division of an international firm moving into a new Denver data center seeks a professional with two years COBOL/Assembler. Knowledge of IBM planning. Will be assigned to enhance new systems development projects. To \$85,000.

**Senior Programmer**—Third-Party, High-technology related computer services firm with well-established Colorado Denver base seeks marketing professional to handle all of your applications to any TP sales territory. Analytical and sales background. To \$85,000.

**COBOL Programmer**—New Development, Progressive firm offers an excellent working environment, outstanding benefits and good career growth in a 60-day employment trial. One year of COBOL, applications experience and preferably, knowledge of personal data systems and JPC/COBOL sought. To \$85,000.

**Staff**—Denver Branch Expansion, International services firm seeks a computer services professional with a strong technical background and sales management experience. Position involves management of new staff to Denver. To \$85,000.

**Programmer/Analyst**—International Travel, Business consulting firm with an international staff base seeks a marketing-oriented Programmer with two years RPG & B. B. experience. Bonus based position as member of a support team. Denver location. To \$85,000.

**Senior "C" Programmer/Analyst**—Business Location, Exciting new opportunity exists in systems development for a professional with two years COBOL and "C" experience. To \$85,000.

**Systems Analyst**—Banking, New American banking department of a large Denver bank is expanding various middle systems and needs a professional with bank operations knowledge and programming skills to work with user department. To \$85,000.

**Real-Time Programmer/Analyst**, National computer development consulting firm is located Colorado Springs. Needs a professional with solid FORTRAN programming experience with any Assembly real-time data applications programming experience, preferably on CDC hardware. To \$85,000.

**COBOL Programmer/Analyst**—International Firm, Progressive corporation with a worldwide customer base needs an experienced COBOL COBOL Programmer/Analyst, or manufacturing experience in development. To \$85,000.

**RPG & Programmer/Analyst**, High tech company based in Salt Lake needs an experienced RPG & RPG/IBM Programmer to assist in the development of new and sophisticated applications on an HP4000. To \$85,000.

**Programmer/Analyst**—IBM, International firm with new data center in Salt Lake needs professional with two years COBOL plus IBM COBOL. Offers full education package. Should have experience. To \$85,000.

**Senior Programmer/Analyst**, International manufacturing company has immediate needs for professionals with computer backgrounds in J28 or IBM-based architectures. Participates in the design and development of new and sophisticated systems navigation systems. Full education package. Should have experience. To \$85,000.

**COBOL Systems Programmer**, British and established Salt Lake organization is in need of a Systems Programmer to build and maintain COBOL on Assembler machines. To \$85,000.

**Senior Local Systems Programmer**, Excellent opportunity for data, technically oriented Programmer with solid IBM Assembly background in main line COBOL. Will train in COBOL, MCP, BSA, J28 and VMS. To \$85,000.

**Senior Programmer/Analyst**, Leading firm in real-estate market and consulting handling systems needs a degree professional with creditable record of software experience on FORTRAN, IBM or IBM hardware. Excellent opportunity to use ability or computer background and programming skills. Salt Lake City location. To \$85,000.

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# EDI Professionals

Middle South Services has one of the South's largest data processing centers serving one of the nation's largest power systems. Middle South Utilities, our parent company, is a major electric utility. Our hardware environment includes two IBM 3081s, and IBM 4341 and Tandem model 16s. If you are a career-minded EDP professional, we have the following opportunities available:

**SENIOR SYSTEMS ANALYST** A current opening exists for an experienced Systems Analyst to provide development and support of the Materials Management Systems in the Power Plant and Materials Section of our Management Systems Department. The ideal candidate will have a minimum of 5 years experience in program development, production support and test coordination on the IBM mainframe including knowledge of report writers or high level languages such as MARK IV, EASYTRIVE, FOCUS and/or RAMES-4. IMS DB/DC experience is a must as well as the ability to direct the work efforts of others. Previous applications experience in material tracking, bills of material, inventory systems, manufacturing systems and/or engineering design interface is preferred but not required.

**(C.I.C.S.) SYSTEMS PROGRAMMER** The selected individual will assume responsibility for our C.I.C.S. System. A BS in Computer Science or equivalent experience required. Must have experience in a large scale MVS environment with large scale C.I.C.S. in a tech support role. Will be responsible for TABLE GEN-SYS/GENS, performance and tuning, problem determination on C.I.C.S. plus MVS dump analysis. Will work with on-line monitors and batch reporting systems. Experience with resolve/C.I.C.S. control/C.I.C.S., ALC programs, and PL-1 or COBOL, a plus. Application interface helpful.

## ANALYST/PROGRAMMERS (APPLICATIONS)

Several positions are currently open for experienced IMS DB/DC Analyst/Programmers. Experience with COBOL or PL-1 in plant maintenance or business applications is needed.

**ANALYST PROGRAMMERS (SCIENTIFIC)** Requires previous experience in scientific applications with a sound knowledge of PL-1 or Fortran. Computer applications development with exposure to a VM operating system would be helpful.

Due to our size and scope of operation, we offer salaries for advancement, career stability and an excellent salary with major benefits. For more information, call our number below or to apply directly, send your confidential resume to: **Byron Heath or Richard Jacobson, MIDDLE SOUTH SERVICES, INC., P.O. BOX 61066, NEW ORLEANS, LA 70161.**

1-800-231-4481

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## SYSTEMS ANALYSTS

Do you like non-routine assignments, creative problem solving, working with top-notch professionals on meaningful projects? If so, ICJ may be worth your consideration. We are seeking well-qualified candidates for these positions in our dynamic corporate MIS Department:

**Systems Programmer—3 or more years' MVS systems programming experience including maintenance of operating systems, MVS-related program products and IBM program products such as SMR, PL/I and COBOL. IBM SSI environment moving to MVS/384.**

**IS Data Base Analyst—4 or more years' data processing experience with in-depth knowledge of one or more data base management systems and a working familiarity with data dictionary products.**

**Data Base Analyst—3 or more years' data processing experience with a working knowledge of IMS DB/DC and other COBOL, or assembler, as well as IMS backup/recovery utilities.**

**IS Systems Analyst—5 or more years' experience in the design and implementation of manufacturing financial or marketing systems in a multi-plant mainframe environment. Experience in MRP II is a plus.**

**IS Scientific Programmer/Analyst—3 or more years' experience in a DEC environment (VAX, PDP 11/70, VMS, NEXT114 and Fortran, a biomedical research or instrumentation background in a plus.**

ICI Americas has over one billion in 1983 is the U.S. subsidiary of a major multi-national corporation. These positions are located at our corporate headquarters, a campus like complex in suburban Wilmington, DE. ICI offers salaries fully commensurate with the regional assistance, excellent benefits including a generous relocation policy and ample growth opportunities. Delaware, "the small wonder" state, offers compensation living with the high costs and other drawbacks of big city living. Why not invest 20 cents in your future by sending your resume including salary in confidence to:

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## INFORMATION CENTER MANAGER

Invitation and challenge opportunity to a person with a proven track record in the information industry. Center at the University of Nebraska Medical Center, a major role in the planning and development of the center. The manager will be responsible for planning and development of the center. The manager will be responsible for planning and development of the center. The manager will be responsible for planning and development of the center.

University of Nebraska  
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Omaha, NE 68105

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## CAD/CAM Specialist

### Start-up opportunity

General Electric Computer Products Department is seeking New York, offers full responsibility for establishing a computer-aided design (CAD/CAM) facility for the manufacture of electronic capacitors.

### The scope

You'll be integrating CAD/CAM capabilities into the design and manufacture of electronic capacitors with specific responsibility for installing and maintaining CAD/CAM software and for providing user training and guidance in software applications.

### Qualifications

BS in Computer Science, Engineering or Math with 2-4 years experience in Mainframe CAD programming, CALMA experience preferred.

### It all adds up

The company, the opportunity and the location... a small-town vacation area with year-round opportunity for outdoor living and recreation. Yet we're within driving range of several major cities. To learn more about responsibilities, compensation/benefits, send resume with salary history to: Mr. Douglas G. Ransome, Dept. 46-7, General Electric Company, Computer Products Department, John Street, Hudson Park, NY 12534.

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## air new zealand

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Systems Programmer/Data base analyst - 2003

Mr. Project Analyst - 2004  
Mr. Project Analyst - 2005  
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Mr. Project Analyst - 2014  
Mr. Project Analyst - 2015

Mr. Project Analyst - 2016  
Mr. Project Analyst - 2017  
Mr. Project Analyst - 2018

Mr. Project Analyst - 2019  
Mr. Project Analyst - 2020  
Mr. Project Analyst - 2021

Mr. Project Analyst - 2022  
Mr. Project Analyst - 2023  
Mr. Project Analyst - 2024

Mr. Project Analyst - 2025  
Mr. Project Analyst - 2026  
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### Assistant Director

Responsible for planning, development, and maintenance of the computer systems, hardware, software, and telecommunications. Also responsible for the operation of the computer systems, hardware, software, and telecommunications.

Qualify yourself positions, before you apply. We will consider your resume only if you are qualified. Applications received by May 15 or

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## DATA BASE

IBM/VS/DCS tech talent in R/L/eng, industrial available for mid-level senior staff positions nationwide in report. Salaries to \$40,000 p.a.

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## ASSISTANT DIRECTOR OF THE COMPUTER CENTER

### USER SERVICES

Corbis College needs a capable experienced person to provide user services support in the use of applications packages. The person will be responsible for the operation of the computer systems, hardware, software, and telecommunications. Also responsible for the operation of the computer systems, hardware, software, and telecommunications.

Corbis College needs a capable experienced person to provide user services support in the use of applications packages. The person will be responsible for the operation of the computer systems, hardware, software, and telecommunications. Also responsible for the operation of the computer systems, hardware, software, and telecommunications.







## HELP BUILD THE FUTURE

Position: a modern hospital state, is helping industrial state hospitals building to future and there is a strong tradition and belief in self-help.

The Age Group Hospital and Medical College, located in Karachi, Pakistan, is currently under construction. It is the country's largest advanced project and upon completion the Hospital will house a 721-bed multi-specialty and general medicine for primary and secondary care facilities throughout Pakistan. This exciting project is being undertaken in phases, with the first phase opening in early 1984.

This Information Systems Department is recruiting staff to complete the financial, administrative and patient-related applications. We require a professional management team of experienced staff in the following positions:

### MANAGER SYSTEMS EDUCATION

You will be fully responsible for setting up a full-time intensive training program in systems analysis, design and programming with special emphasis on applications in the field of health care.

You must have at least 5 years experience in developing and implementing systems to coordinate systems. A B.Sc. or a M.Sc. Degree would be a definite asset.

### MANAGER SYSTEMS OPERATIONS AND SUPPORT

Responsibilities include planning of the physical facilities, installation of equipment, development of policies and procedures, and management of the hardware support function. You will also direct the training of the Computer Operators.

Ideally, you will have had several years related experience in large hospitals/institutions. A Degree in Computer Science, or related field, and previous hardware experience are mandatory.



The Aga Khan Hospital and Medical College, Karachi

### APPLICATION SYSTEMS SPECIALIST

You will manage a group of software designers and work with them in the development of application systems. You will also assist in the development of software planning and be directly involved in the training of personnel.

You must have a Degree in Computer Science with 3 to 5 years hospital experience in the development and implementation of a group of application systems.

### SENIOR SOFTWARE DESIGNERS

As a leader of a Systems Team you will be responsible for the analysis and evaluation of computer software packages, and the planning and implementation of modifications to existing packages. You will also assist in the training of Information Systems personnel.

You possess a Degree in Computer Science, or related field, and have at least 3 years experience in the planning and development of computer software packages and hardware involving application development systems to a professional.

### USER CO-ORDINATORS

As the primary communication link between User Departments and the Information Systems Department, your major responsibilities will be to analyze and specify user requirements.

You have at least 2 years experience in a computerized hospital information systems environment. Excellent oral and written communication skills and prior experience in formal training are definite assets.

These positions can provide you substantial personal and professional rewards. We also offer competitive salaries and benefits packages. If you meet the requirements, please send your resume or call for an interview. To: Liaison Officer, Aga Khan Hospital and Medical College, 4211 North Coast Road, Karachi, Pakistan, Karachi 75210, (91) 1416 4748-4749.

## Data base administrator

TRW Database Division, a leading supplier of host and other hardware, is seeking an IBM Data Base Administrator. This challenging opportunity, in state-of-the-art large IBM mainframe environment, includes overall responsibility for growth and expansion of the division's integrated data base.

Desirable experience includes:

- A Math or Computer Science Degree
- A minimum of 4 years experience in systems development
- Extensive data base management experience (DBMS professional)
- Define (DBS) applications knowledge in DB/VS2 environment
- Previous DBA responsibilities preferred
- Well developed written and oral communication skills

TRW offers an outstanding salary and benefits package including an educational assistance program, stock savings plan, medical/dental/vision care, flexible working hours, year-end bonuses, relocation package and company paid retirement. For immediate consideration, send your resume and salary requirements in confidence to:

Manager, Division  
Employee Relations  
TRW DATABASE DIVISION  
402 Chandler Street  
Jamaica, NY 11476

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## MIS Project Specialist

RCA's New Product Division, requiring long term business, products... and ultimately new businesses for the corporation, is seeking an MIS Project Specialist.

Currently we seek a well-rounded, data processing professional with several recent years experience with IBM/AS/400 systems as well as adequate, up-to-date familiarity with HP/300 hardware.

The successful candidate will be able to:

- Work with users on software package installations and interfaces
- Act as consultant to both users and other data processing on software levels and techniques

In addition to a fine starting salary, we offer a generous benefits package. For immediate consideration, send resume to T.J. Clements, Mail Stop C700-063, New Holland Ave., Lancaster, PA 17604. We are an equal opportunity employer.

**RCA**  
New Products Division

## \$80,000 YR - CICS PROGRAMMING

Available only for those with a minimum of 1 year programming experience in CICS. We are seeking a CICS Programmer for a major project. The successful candidate will be responsible for the design, development, testing, and implementation of CICS programs. The position offers a competitive salary and benefits package. For consideration, send resume to: T.J. Clements, Mail Stop C700-063, New Holland Ave., Lancaster, PA 17604. We are an equal opportunity employer.

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### HARDWARE/SOFTWARE ENGINEER

Hardware/Software Engineer needed to design and develop software for the control of industrial machinery. The successful candidate will be responsible for the design, development, testing, and implementation of software programs. The position offers a competitive salary and benefits package. For consideration, send resume to: T.J. Clements, Mail Stop C700-063, New Holland Ave., Lancaster, PA 17604. We are an equal opportunity employer.

Hardware/Software Engineer needed to design and develop software for the control of industrial machinery. The successful candidate will be responsible for the design, development, testing, and implementation of software programs. The position offers a competitive salary and benefits package. For consideration, send resume to: T.J. Clements, Mail Stop C700-063, New Holland Ave., Lancaster, PA 17604. We are an equal opportunity employer.

### COMMUNICATIONS and COMPUTER SCIENCE SPECIALISTS

At FORTUNE we are professional specialists in the field of communications and computer science. We are seeking individuals with a minimum of 1 year experience in these fields. The successful candidate will be responsible for the design, development, testing, and implementation of software programs. The position offers a competitive salary and benefits package. For consideration, send resume to: T.J. Clements, Mail Stop C700-063, New Holland Ave., Lancaster, PA 17604. We are an equal opportunity employer.

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### PROGRAMMER/ANALYST ADVISOR

Non-profit criminal justice agency in New York City seeks program manager experienced in ADOBE programming and RISK systems; VAX/VMS experience helpful. Salary open; excellent benefits. Send resume and salary.

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Consultants  
Box 800  
Princeton, NJ 07170

### PRODUCT PLANNING, MANAGER

To work in New York City. Candidates for position must have a minimum of 5 years experience in product planning and management. The successful candidate will be responsible for the design, development, testing, and implementation of software programs. The position offers a competitive salary and benefits package. For consideration, send resume to: T.J. Clements, Mail Stop C700-063, New Holland Ave., Lancaster, PA 17604. We are an equal opportunity employer.

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## Opportunities in Management Consulting San Francisco

We are an international consulting firm seeking to expand our Management Consulting Services to meet growing client demands. You will work directly with clients and must possess excellent written and oral communication skills. Prior consulting experience is desirable but not required for qualified candidates.

Two immediate and diverse needs exist, both offering outstanding career and compensation potential:

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Opportunities for both senior (three to five years' experience) and entry level (one to three years' experience) consultants.

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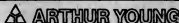
- PBX & CSX switches
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- Longhaul Voice and Data Networks
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Responsibilities will include planning, design specification and implementation of all elements of digital and analog voice and data communication systems for clients.

### Data Processing

Three to five years' hands-on experience with mainframe and minicomputer systems. Must be capable of assessing client hardware and software needs and developing pragmatic solutions to meet those needs. Engagements typically span planning and implementation support. A broad range of hardware and software experience combined with sound project management skills is required.

If you believe you qualify and are willing to make a commitment to our growth, reply in confidence with resume and salary history to: Arthur Young & Company, Director, Management Services Department, One Post Street, San Francisco, California 94104, Attention: Department 2888. An equal opportunity employer m/f.



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The Wackenhut Corporation has excellent growth opportunities for Systems Analysts and Programmer/Analysts to become involved in the development of our corporate communications network and associated on-line applications in multiple VAX 11/750 locations.

**SYSTEMS ANALYST** - Successful candidates will possess excellent oral and written communications skills, be experienced in all phases of systems development from requirements definition through implementation and be disciplined in all aspects of project control. A background in the tele-communications and on-line interactive systems desired.

**PROGRAMMER/ANALYST** - Application experience in the design and installation of administrative, financial and logistical systems, in a super-mini environment desired. Responsibilities will include detailed system design, program development and implementation. Candidates should have a proven background in programming ability and user relations.

Our compensation package is highlighted by health and dental plan and 4-day work week. For consideration, call or submit resume to:

Human Resources  
THE WACKENHUT CORPORATION



3000 Phoebe De Lane Blvd.  
Coral Gables, FL 33134

In Florida - 1 (800) 426-0861 ext. 441  
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## NATIONAL UNIVERSITY OF SINGAPORE

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We require Teaching and Development staff in the following areas:

- OFFICE AUTOMATION
- PROJECT MANAGEMENT - LOCAL AREA NETWORKS
- INFORMATION RESOURCE MANAGEMENT
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- MICROCOMPUTER-BASED INFORMATION SYSTEMS

The Director of ISS is expected to be in U.S.A. in the second week of May '84. He will be able to meet potential applicants in that period.

### THE JOB:

You will be working in small teams to develop short intensive courses aimed at upgrading the skills of executives, managers and IS professionals from organizations in Singapore and South East Asia. You will also participate in teaching a post-graduate Diploma course in Systems Analysis. In addition, you will have opportunities to engage in consultancy and applied research.

ISS provides a stimulating environment for state-of-the-art practitioners from a variety of backgrounds to interact and develop through close teamwork.

### THE INSTITUTE:

Established in 1981, the Institute's objective is to promote the rapid development of leading edge computerization both in the public and private sectors, and to participate in the development of Singapore as a regional center for software and development and services. Technical leadership is awarded through quality management education, advanced technical training, consulting services and applied research. ISS has excellent educational and computer facilities.

### SINGAPORE:

Singapore is well-known as a commercial, financial, industrial and communications center in South East Asia. Vigorous economic growth persists, and it has the second highest per capita income in Asia after Japan. American and British expatriates have consistently ranked Singapore as one of their top 3 overseas postings.

### APPLICANTS:

Applicants should have a strong practical background in at least one of the areas mentioned and be motivated towards a job involving a substantial portion of development and teaching of leading edge material.

Applicants for positions at a more junior level, should have at least 3-6 years of experience.

### COMPENSATION:

(Salary (to U.S. \$65,000/year)) is commensurate with experience. Benefits include an additional 25% Provident Fund contribution, heavily subsidized accommodation, medical and leave benefits, passage assistance and baggage allowance, settling-in allowance and children's education allowance. (U.S. \$1.00 = S\$2.10 approximately).

Application forms and further information on conditions of service may be obtained from:

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North America Office  
NATIONAL UNIVERSITY OF SINGAPORE  
One Nanyang Plaza  
61 West 63rd Street, Suite 4J  
New York, New York 10023, U.S.A.  
TEL: (212) 786-1670



OR: THE DIRECTOR,  
Personnel Department  
NATIONAL UNIVERSITY OF SINGAPORE  
Kent Ridge, Singapore 0611  
REPUBLIC OF SINGAPORE

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Portland, Maine 04101  
(207) 772-4748

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Applications are invited for department head, Computer and Office Information Systems. The department has 12 faculty members with programs in Computer Information Systems, Office Administration, and Business Education. The University has 11,000 students, including 2,200 in AACSB-accredited business programs. Candidates must possess good communication skills and successful teaching experience. Desirable qualifications are a doctorate in CS, MIS, or related field, five years experience related to computer/office information systems, publications, and administrative experience. Salary and rank are commensurate with qualifications. Send resume, transcripts, and letters of reference to: Dr. Van Houten, Dean, College of Business Administration, Northeast Louisiana University, Monroe, Louisiana, 71202. An EEO/AA employer.

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## JOIN US IN OUR SOFTWARE CHALLENGE!

Software Relocation Technology's goal is to render current software relocation problems obsolete. We intend to do this by providing software maintenance programs with an integrated set of automated productivity tools to make their work extremely less tedious—and ultimately more valuable. To assist in accomplishing our goal, we are looking for professionals with the following expertise:

### SOFTWARE TOOLS DEVELOPER

We are looking for a well-versed software development specialist with at least 5 years experience. You should be capable of designing, implementing and delivering user friendly tools. Knowledge of Cobol or Pascal would be a plus, would experience on an IBM mainframe or on complex writing.

### MARKETING SOFTWARE ENGINEER

You will act as liaison between customers and our product development department. Your role will evolve as our product moves from specification to development to testing, and then into user installation. Your position will become the cornerstone of our customer support organization. You should possess 5 years related experience, including customer support and/or technical sales and a background in Cobol applications software on an IBM mainframe system (under MVS and/or VM).

If you are qualified—and enjoy working in a team environment—we would like to hear from you. SRT offers not only the high excitement of a state-of-the-art company, but also stock options and competitive salaries and benefits. Please send your resume indicating the position of interest on the envelope to: Software Relocation Technology, Dept. DE, 599 N. Mehlville, Suite 200, Sunnyvale, CA 94086. EOE

**SRT** SOFTWARE  
RELOCATION  
TECHNOLOGY

### MODEM ENGINEERS

NEC AMERICA, INC., has established itself as the technological leader in the modem marketplace. We need the following data communications specialists to support our 200% annual sales expansion.

#### Modem System Engineer

Analyze data transmission system, especially voice-band data transmission.

#### Modem Design Engineer

Design modulation/demodulation and filter circuits for low-speed to medium-speed modem.

Minimum of 3 years experience in the telecommunication/data communications environment. Knowledge of protocols, exposure to datacom applications, field service or application engineering a plus.

All positions are located in our Sunnyvale Headquarters. We offer a competitive salary and comprehensive company paid benefits program including tuition reimbursement. Please send resume with salary history in confidence to:

**NEC**

Personnel Administrator  
NEC America, Inc.  
1012 Stewart Drive  
Sunnyvale, CA 94086  
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### PROGRAMMER ANALYST

Consult, design, code, test, and maintain computer programs in PL/I language for large fast processing rates with full automated test facilities for each service. Knowledge of a variety of programming languages including FORTRAN, PL/I, BASIC, SAS and others with IBM mainframe. Two years' experience as programmer/analyst with one year as programmer in similar capacity. One year testing on IBM operating systems and PL/I language. Working hours are 8:30 a.m. to 5 p.m., 35-40 hours weekly. "This offer and/or" need resumes to:

7918 Woodland Avenue  
Room 012, Bloomington 61804  
Bloomington, IL 61801

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### SOFTWARE PERSONNEL DIRECTORY

Software personnel at all levels of experience needed, now, for several solid job opportunities with leading edge companies. Our long established recruiting firm is national in scope and all fees are paid by our retained client companies. Please send resume with current salary and location restrictions in confidence to:

CW-0004, Computerworld,  
Box 980, Framingham, MA 01701

### OLD DOMBON UNIVERSITY

Student/Teacher Transfer: Transfer your credits from August 1, 1984, to complete your education in computer technology applied to education, medical, business, and other fields. Fully accredited university. The opportunities include teaching undergraduate and graduate courses. You will receive a salary commensurate with experience. Send your resume with current salary and location restrictions in confidence to: Old Dombon University, 1000 Main Street, Suite 100, Old Dombon, MA 01864. Old Dombon University is an affirmative action, equal opportunity institution.

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ParisiSys software engineering firm has two outstanding situations for a systems programmer and a systems analyst. Both positions require a minimum of 5 years experience in IBM mainframe systems (under MVS and/or VM). High profile position in leading edge technology company. Interviewers confidential.

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Ph.D. in Computer Science for M.S. in Computer Science with doctorate in related field to teach at a small three-credit college with a PC/XT/AT and PC/XT/AT in a RSTS environment. Full-time, tenured position for 1984-1985.

Send resume to T.R. Blackburn, Chair, Division of Mathematics and Natural Sciences, St. Andrews College, Laurinburg, North Carolina 28552.

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Immediate opportunities exist now at all levels in virtually every industry. All fees paid by our client company. Call or write for information in complete confidence. Resumes not needed.

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Mediflex Systems Corporation, a leader in the development of Health Care Software Systems is seeking Programmer Analysts to join a project team based in Houston, TX, responsible for the development and support of new software products. Positions available in Cleveland and Chicago. Specific requirements include:

- 3+ years COBOL programming experience
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Mediflex will provide a comprehensive benefit program, relocation assistance and highly competitive salary. Please submit your resume to:

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The most powerful computer for on-line transaction processing in the world.

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Specify, design and implement CPU diagnostics used to verify all areas of a microprogrammed mainframe CPU (ALU, cache, I/O channel, main memory). Work

with the CPU logic designers to analyze and make improvements in the areas of fault detection and isolation. Design, implement and debug microcoded diagnostics. Integrate diagnostics into a modern operation and service subsystem which includes AI-based fault analyzers. Requires a strong knowledge of digital logic test techniques and microprogramming with 2+ years' experience. High-level language and microprocessor experience helpful.

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Design and implement part of a modern operation and service subsystem. Provide functions for cold load, operation, diagnosing, and system software debug of a multiprocessor mainframe computer system both locally and remotely. Work with hardware, operating system, diagnostic, and fault analyzer designers to develop an integrated operation and service environment. Requires high-level language and/or microprocessor experience, knowledge of operation and service problems, and 3+ years' experience. Data communications or operating system experience a plus.

Please call COLLECT or send your resume to Joy Mac for more details about these positions, and about our 6-week paid sub-subsistence. Tandem Computers Inc., Dept. 416-JM, 19333 Valico Parkway, Cupertino, CA 95014, (408) 725-5097. We are an equal opportunity employer.

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# CRAY

## RESEARCH, INC.

### SOFTWARE INSTRUCTORS

Positions available for instructors to design, develop and implement operating system training for employees and customer personnel. Our instructors will be working on the Cray operating system, V20 subsystem operating system and the UNIVAC system. Qualified candidates must have a strong background in operating system fundamentals and several years of training experience. A working knowledge of instructional system design is a plus.

### PROGRAMMER ANALYSTS

Immediate opportunities are available for individuals to work within the Cray test department. We are seeking applicants with 3 or more years of experience in system programming to test DOS operating systems, and individuals with a BS in Computer Science to test FORTRAN compiler, loaders, assembler and utilities. Individuals with a working knowledge of UNIX\* desirable.

Cray Research offers an excellent compensation package and salaries commensurate with experience. For confidential consideration, submit a resume or letter outlining qualifications to:

John C. Borchers  
Department 423  
CRAY RESEARCH INC.  
1440 Northland Dr.  
St. Paul, MN 55120

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# BUSINESS SYSTEM ENGINEER

Long Island based corporation seeks professional to assist in defining divisional manufacturing data processing requirements, investigate system change requests and analyze divisional mini or micro computer system proposal.

Must have a BS in computer science and a MS in industrial engineering with proficiency in COBOL and microprocessor programming.

Travel is required. Salary in low 20's commensurate with capabilities. Send resume to:

Reply to CW-84800

Computerworld

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### Senior Database Analyst

Requires 3-5 years as a Database Analyst using MS/DB or a CICS/VS/DB environment.

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Requires experience with SNA/VS, MVS/VS, all generation languages (FORTRAN, COBOL, MARK IV), plus a project management background in industrial engineering, prototyping, software design and development methods.

### Systems Programmers

Positions require experience in one of the following areas. Four to six years' HP2000 experience plus SNA, PASCAL, MPE experience, DCP system, and data communications in MPE to maintain environment or 4-6 years' IBM experience with SNA, COBOL or VMS/DB.

### Project Leaders

Requires 4 years' experience and implementation of DP projects, life cycle methodology, HP2000 experience and knowledge of accounting structures, JCL programming, BSC with experience in semiconductor environment preferred. Plus experience with data acquisition techniques, both in hardware (CIC, VOICE input and telemetry with front-end microprocessor/data computers).

### Manufacturing Applications Programmer

Requires 4+ years' applications programming in an HP2000 environment, with MAGE/DATABASE and COBOL.

### Functional Applications Manager

Requires minimum of 10 years' experience in large computer data processing, will split 50% project management, manufacturing applications and international multi-site support experience. Also requires knowledge of performance capacity analysis.

### Programmer/Analyst

Requires experience with Xerox, Unix or VMS operating systems, Shell programming language, and System 2000 Natural language. Two to four years' experience with hardware development.

### MIS Risk Management

Requires minimum of 4 years' experience in DP environment in programming systems operations area with a minimum of 2 years' exposure to DATA SECURITY and DISASTER RECOVERY.

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